



Supplement of

Further validation of the estimates of the downwelling solar radiation at ground level in cloud-free conditions provided by the McClear service: the case of Sub-Saharan Africa and the Maldives Archipelago

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Here are given graphs of the comparisons between McClear-v3 estimates and ground-based measurements for all stations ordered by decreasing latitude and for (1) global irradiance G , (2) direct component at normal incidence B_N , (3) clearness index KT and (4) direct clearness index KT_{BN} . At each station, the description is as follows:

- Top left graph shows the 2D histogram between measurements (horizontal axis) and McClear-v3 estimates (vertical axis). The color indicates the number of pairs in each class.
- Top right graph shows statistical indicators (correlation coefficient, relative bias and relative root mean square error) per month. Each year being represented by one color.
- Bottom left graph shows boxplots of the ratios between the McClear estimates (Est) and the measurements (Meas) for several classes of various variables. In each boxplot, the red point is the mean while the lower, middle, and upper lines are respectively the 25, 50 and 75 percentiles. The number of samples is given for each class. Only classes with at least 50 samples are drawn.
- Bottom right graph. Same as Bottom left graph but for the difference between the McClear estimates (Est) and the measurements (Meas).

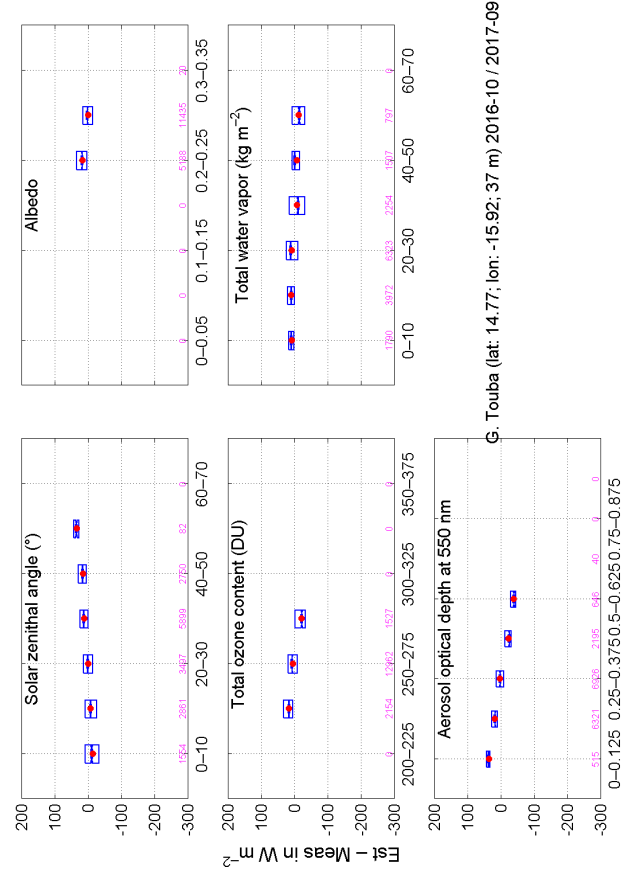
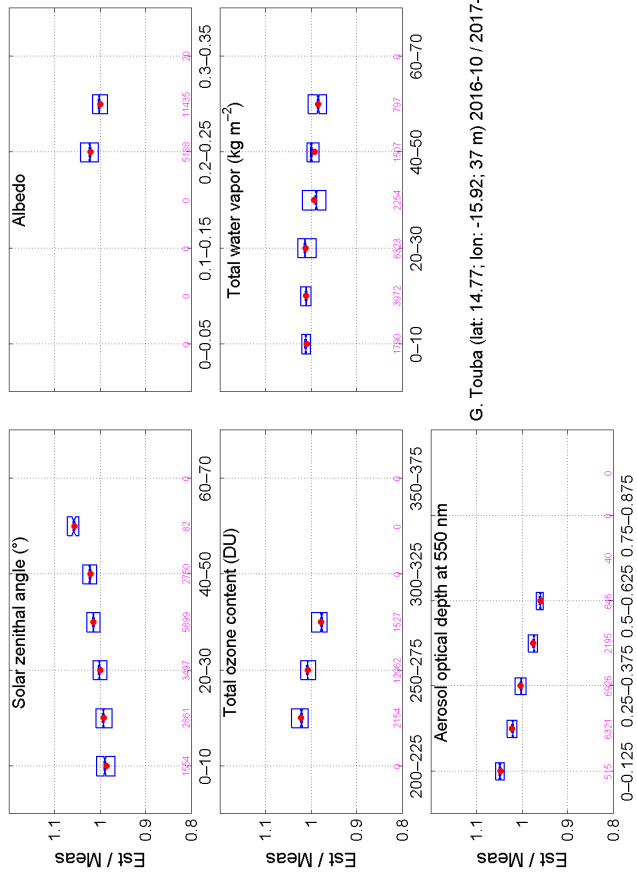
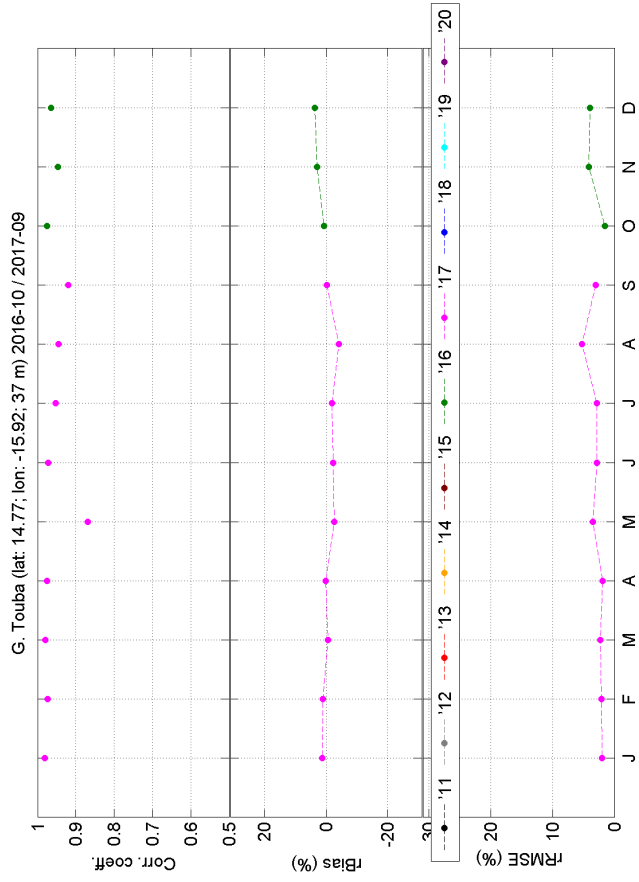
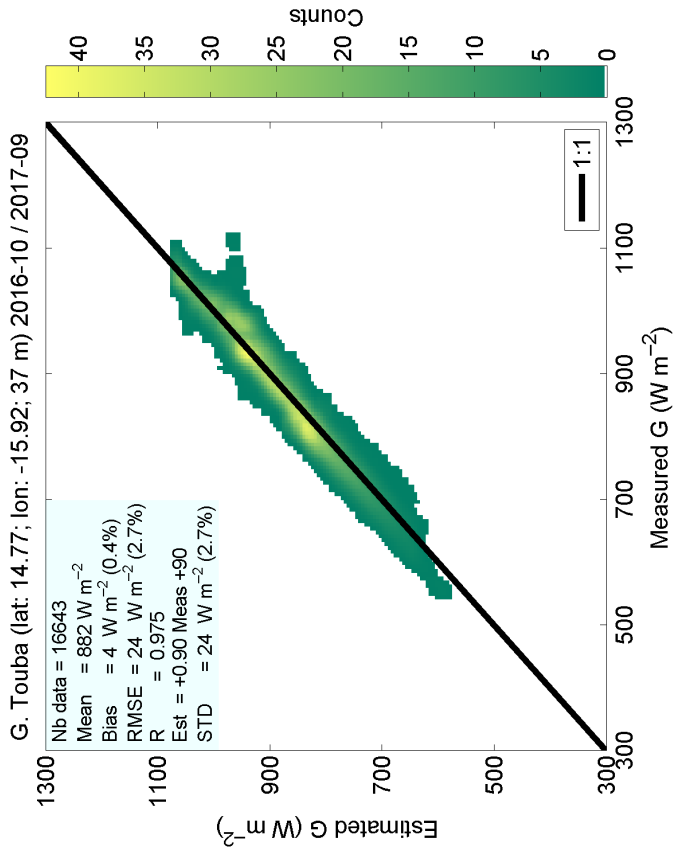


Figure S1: Comparison on global irradiance at Touba

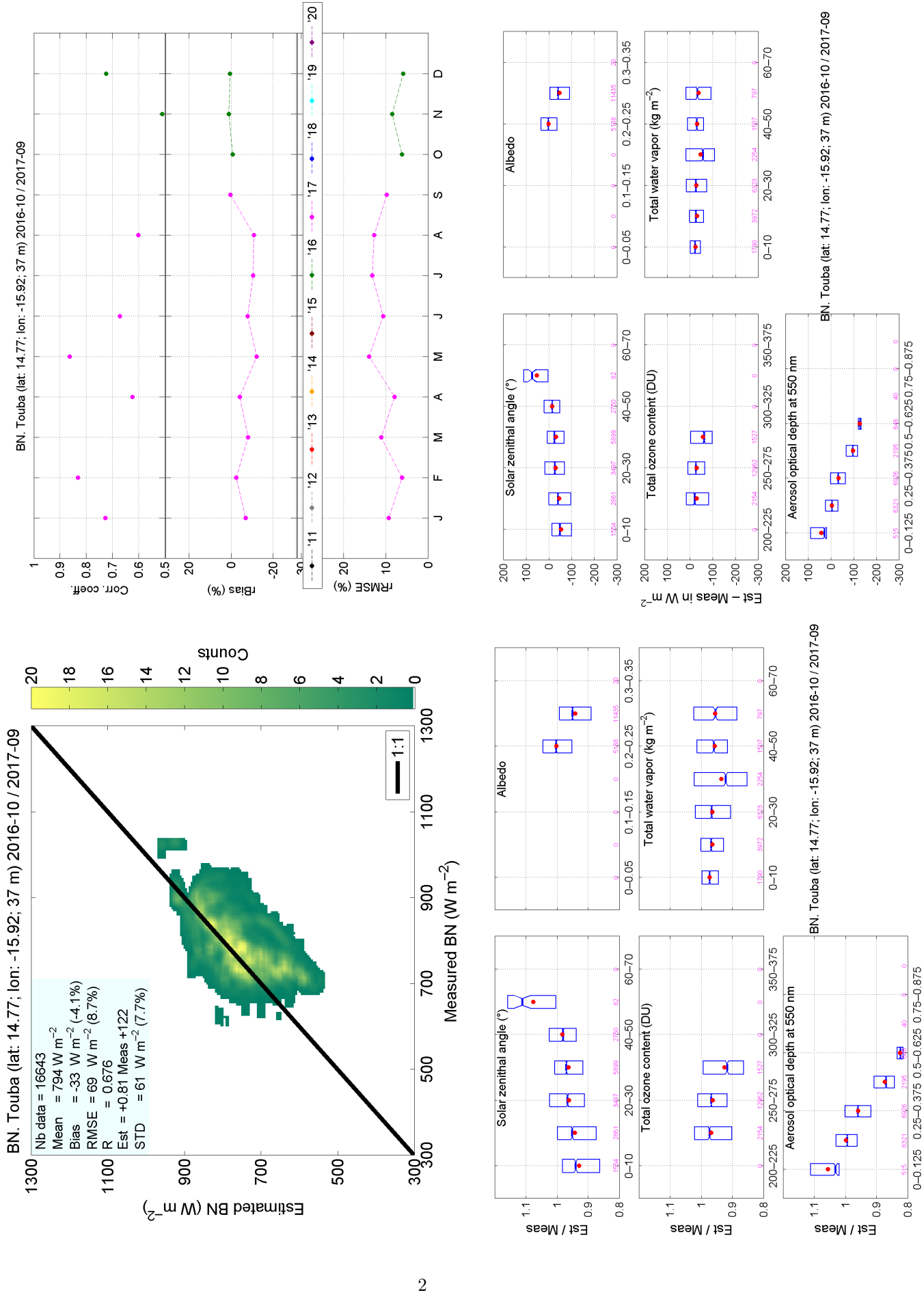
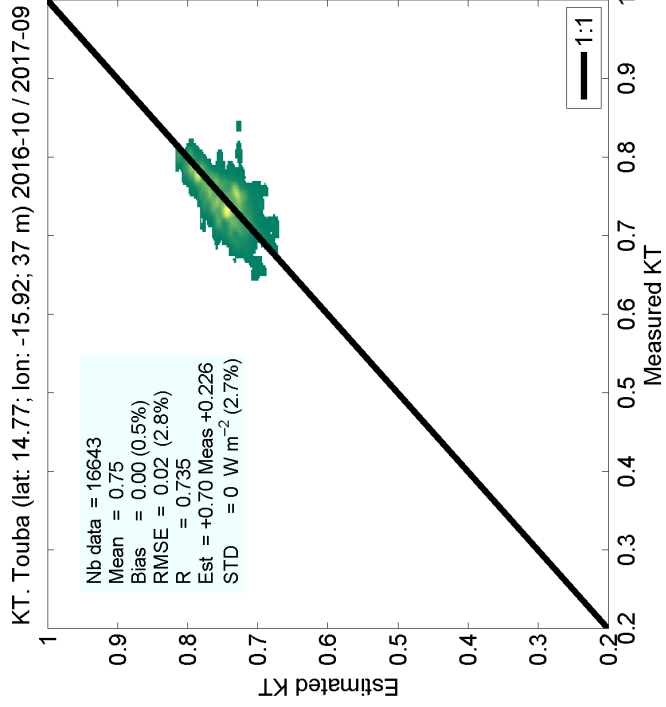


Figure S2: Comparison on direct component at normal irradiance at Touba



KT. Touba (lat: 14.77; lon: -15.92; 37 m) 2016-10 / 2017-09

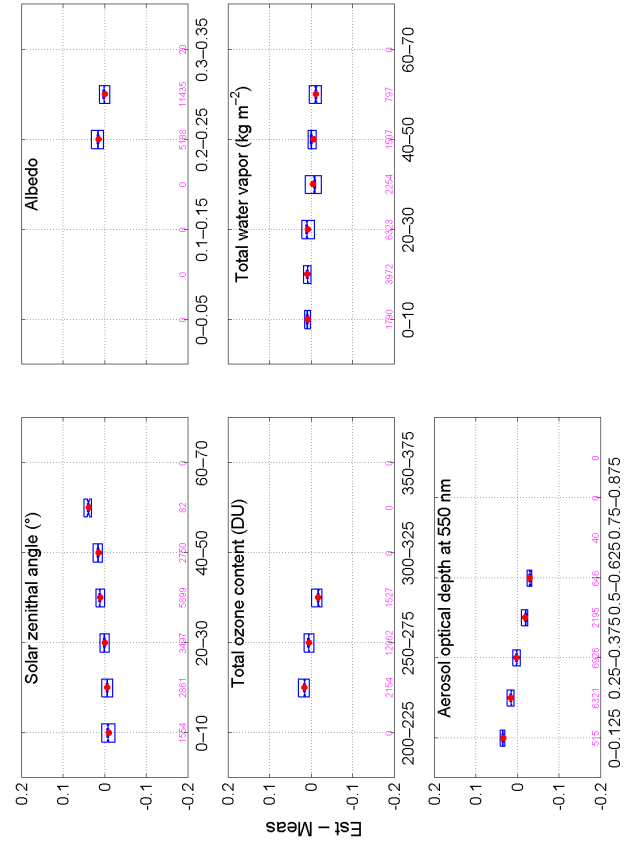
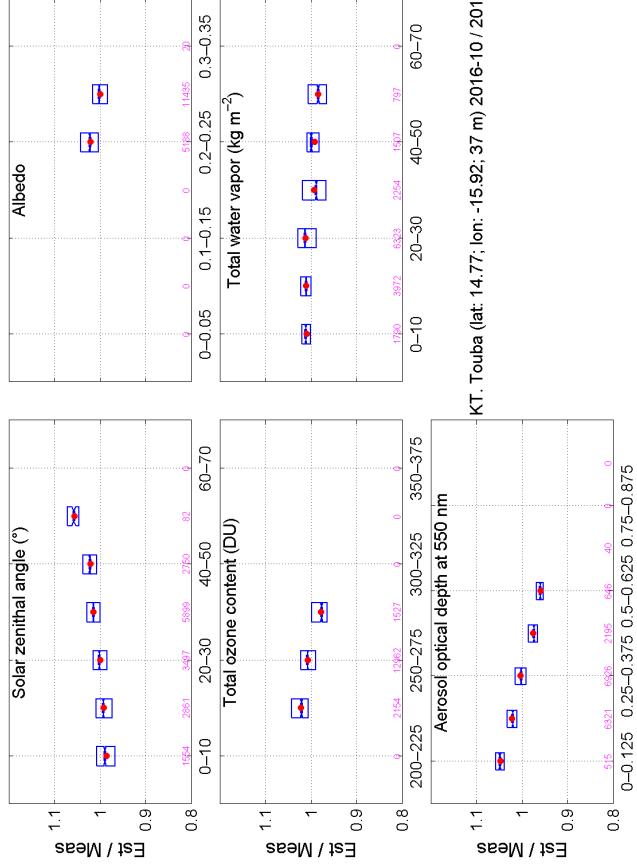
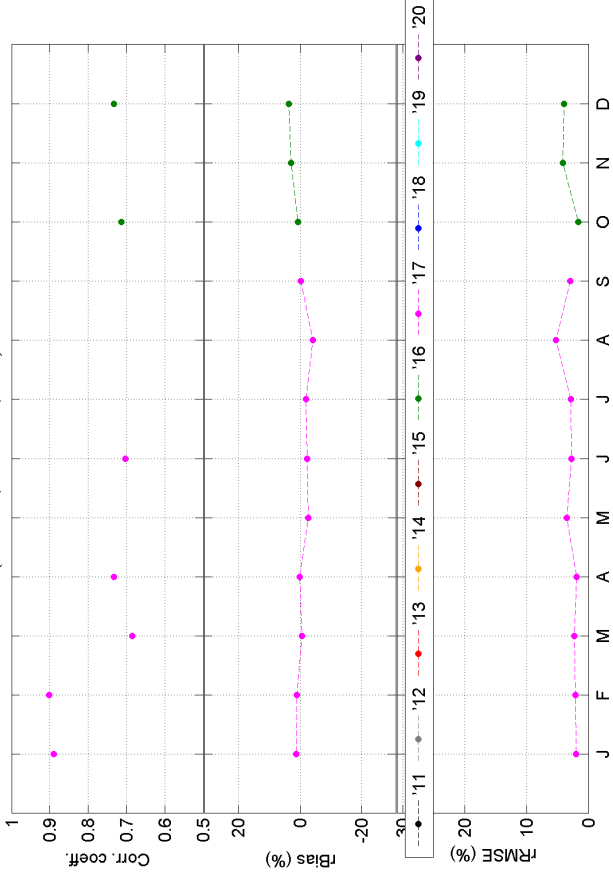


Figure S3: Comparison on clearness index at Touba

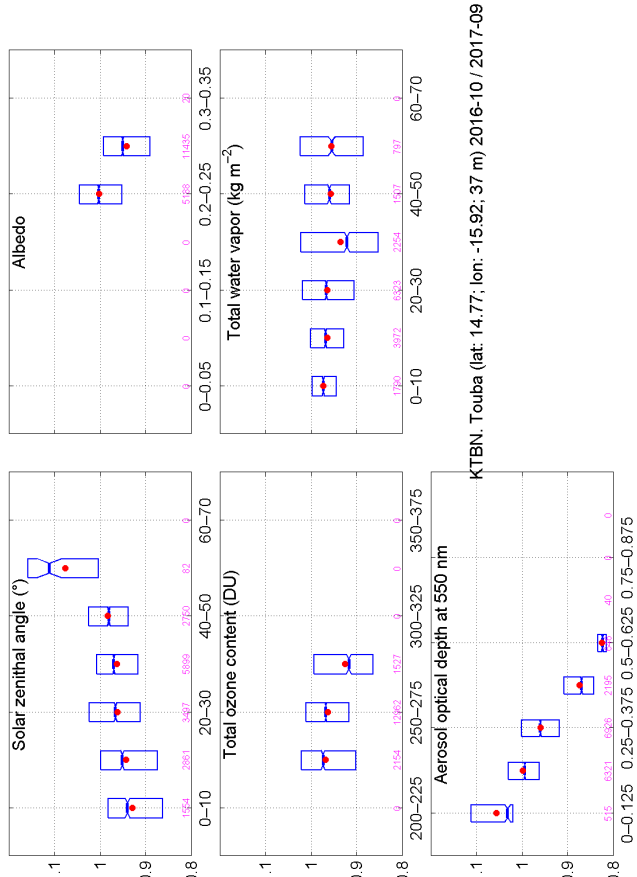
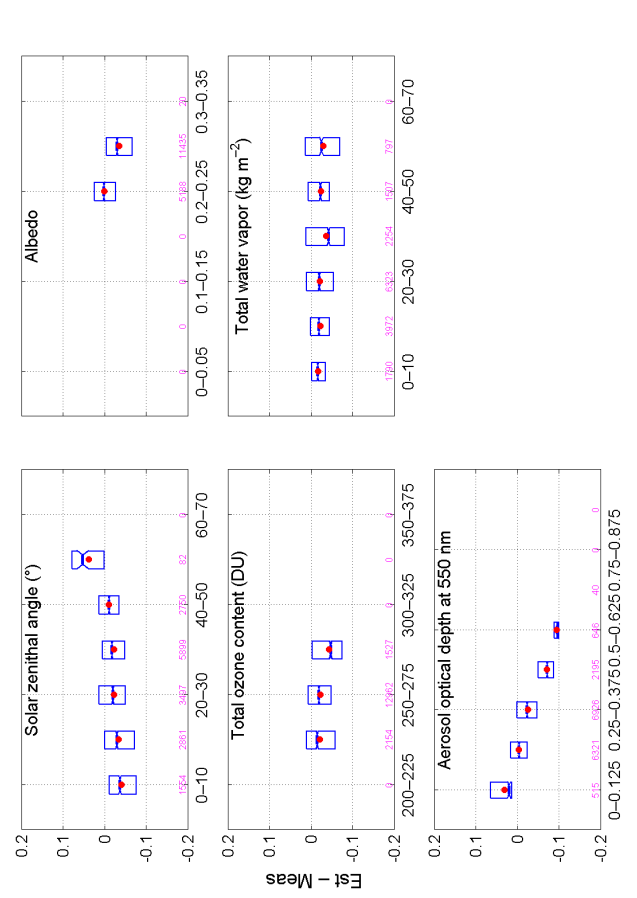
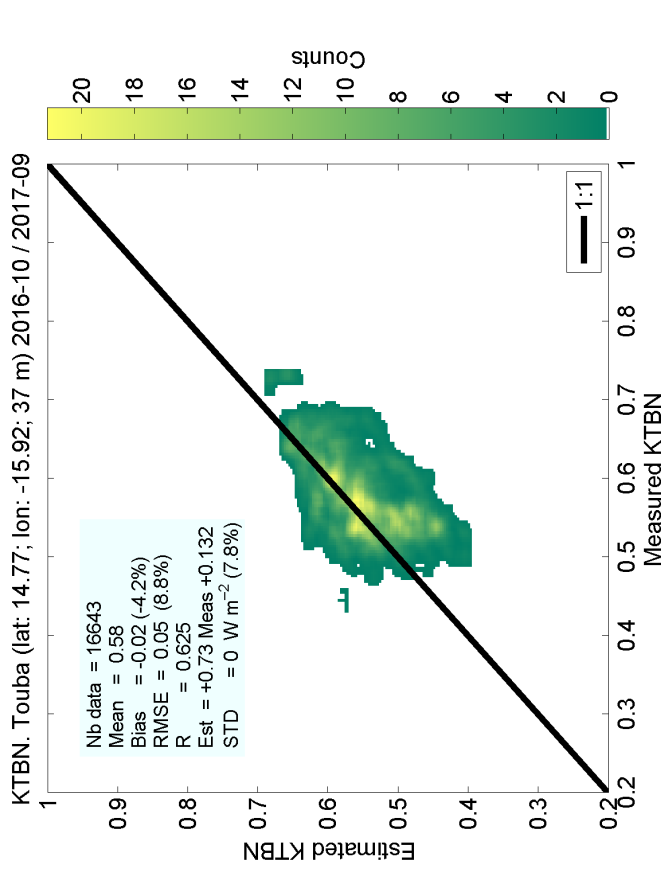
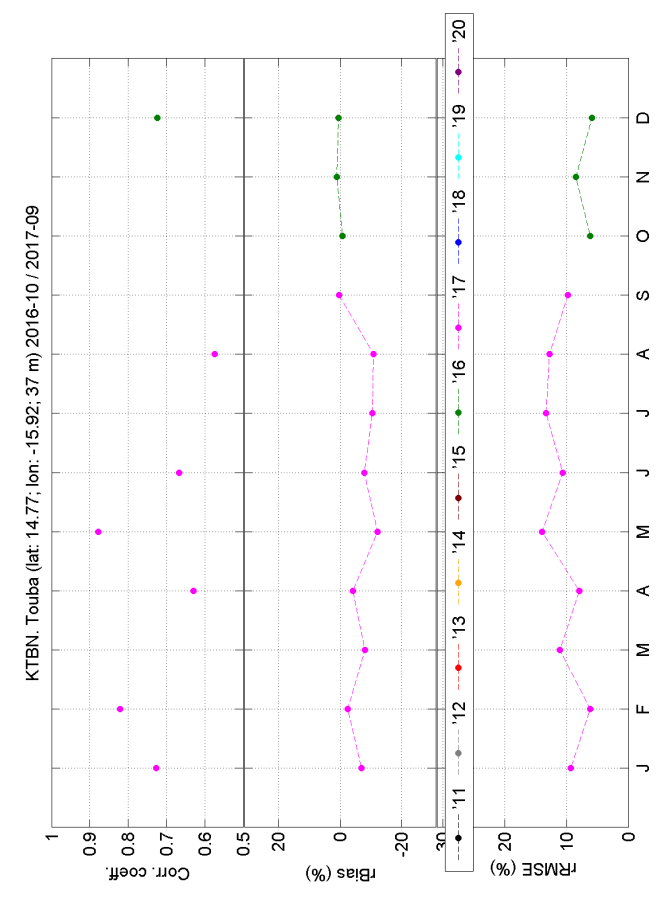


Figure S4: Comparison on direct clearness index at Touba

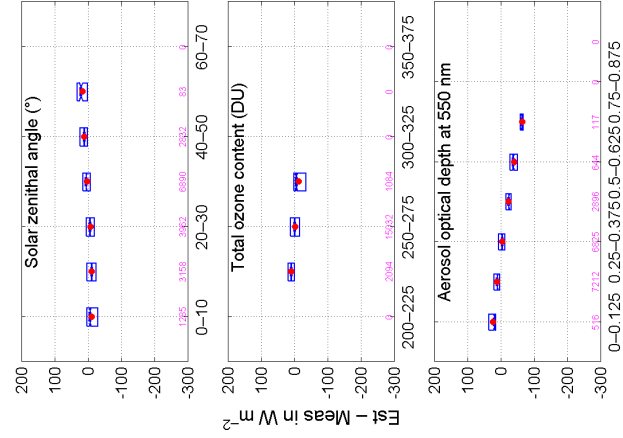
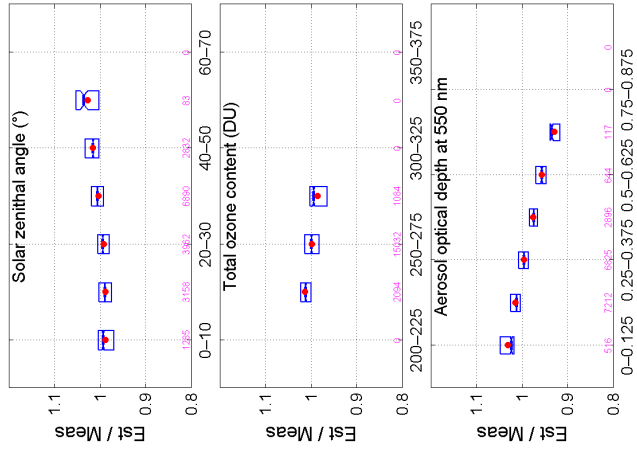
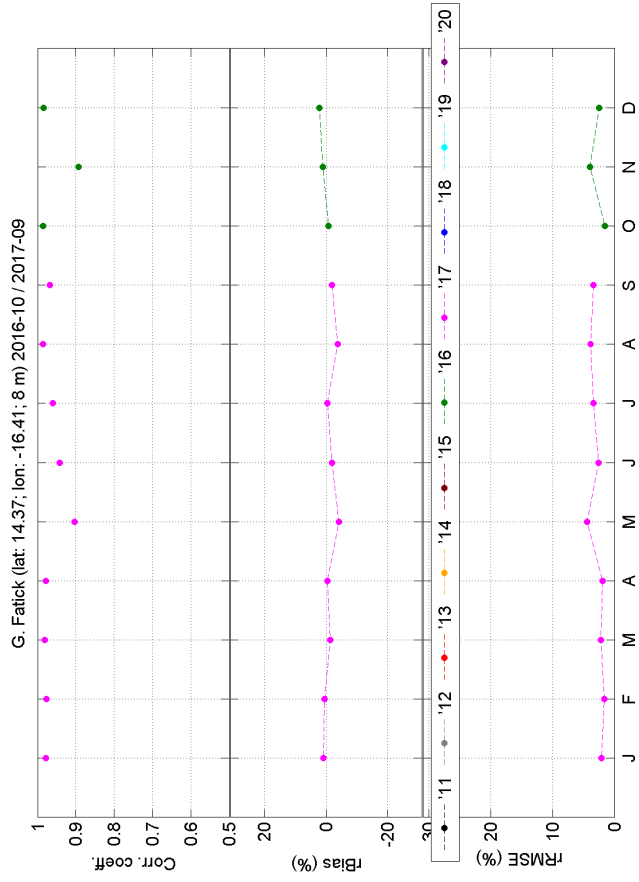
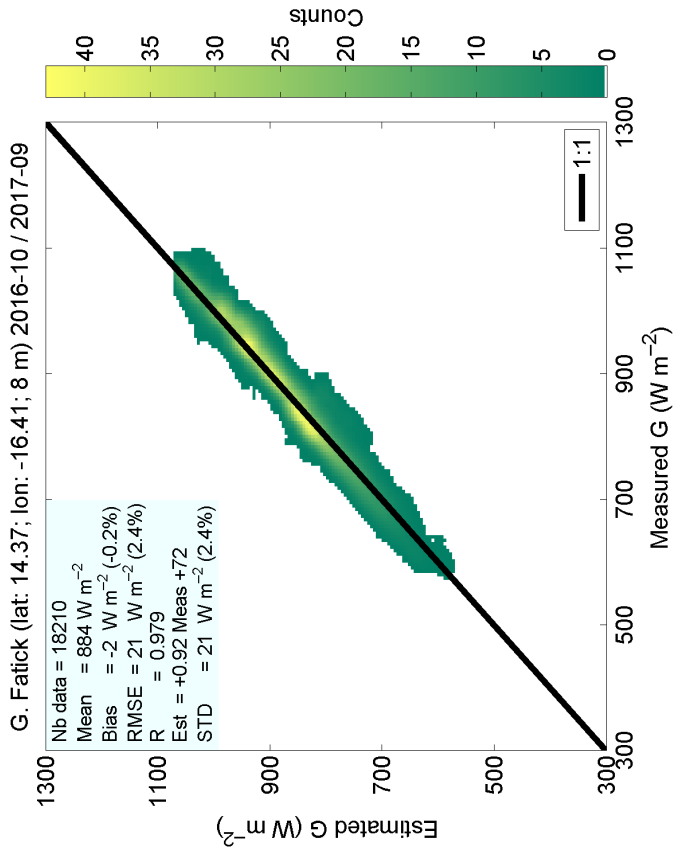


Figure S5: Comparison on global irradiance at Fatick

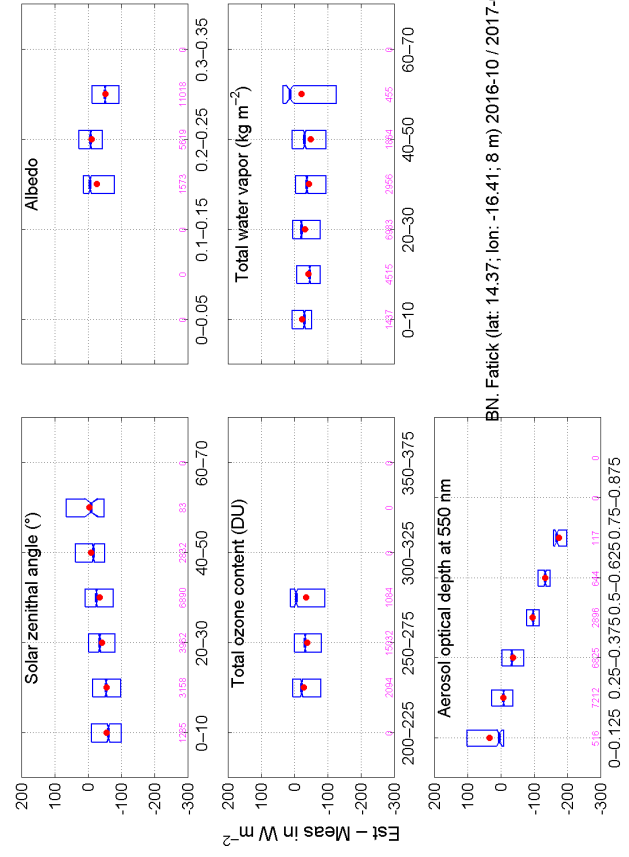
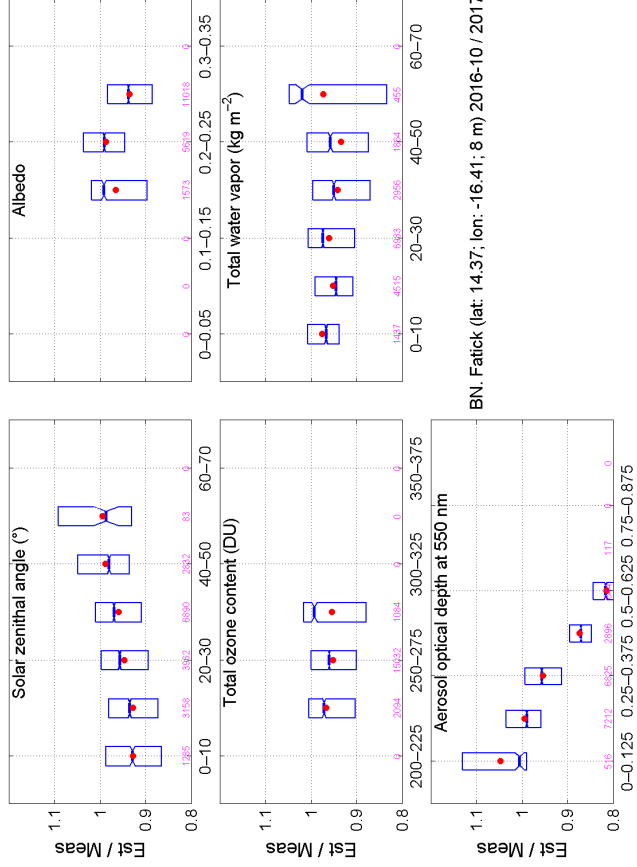
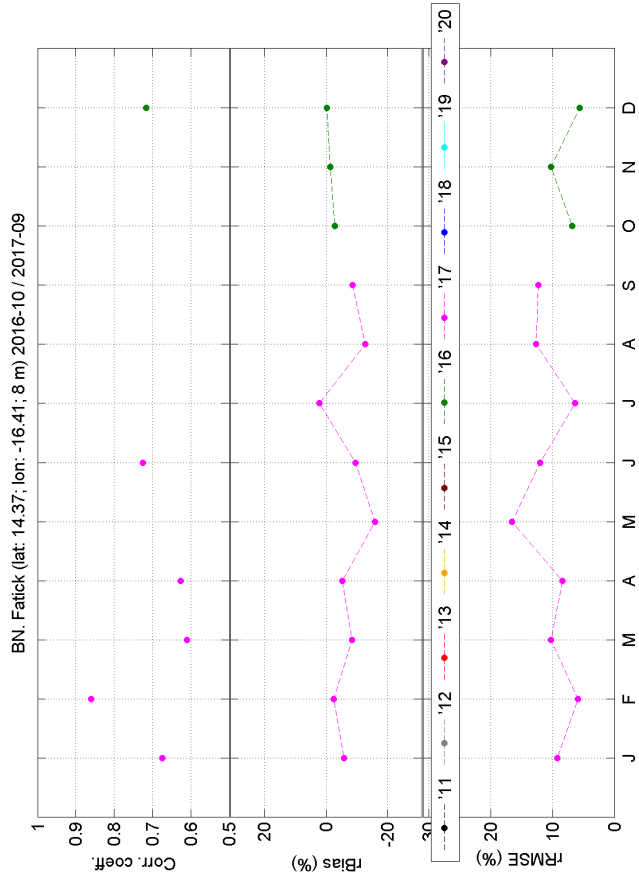
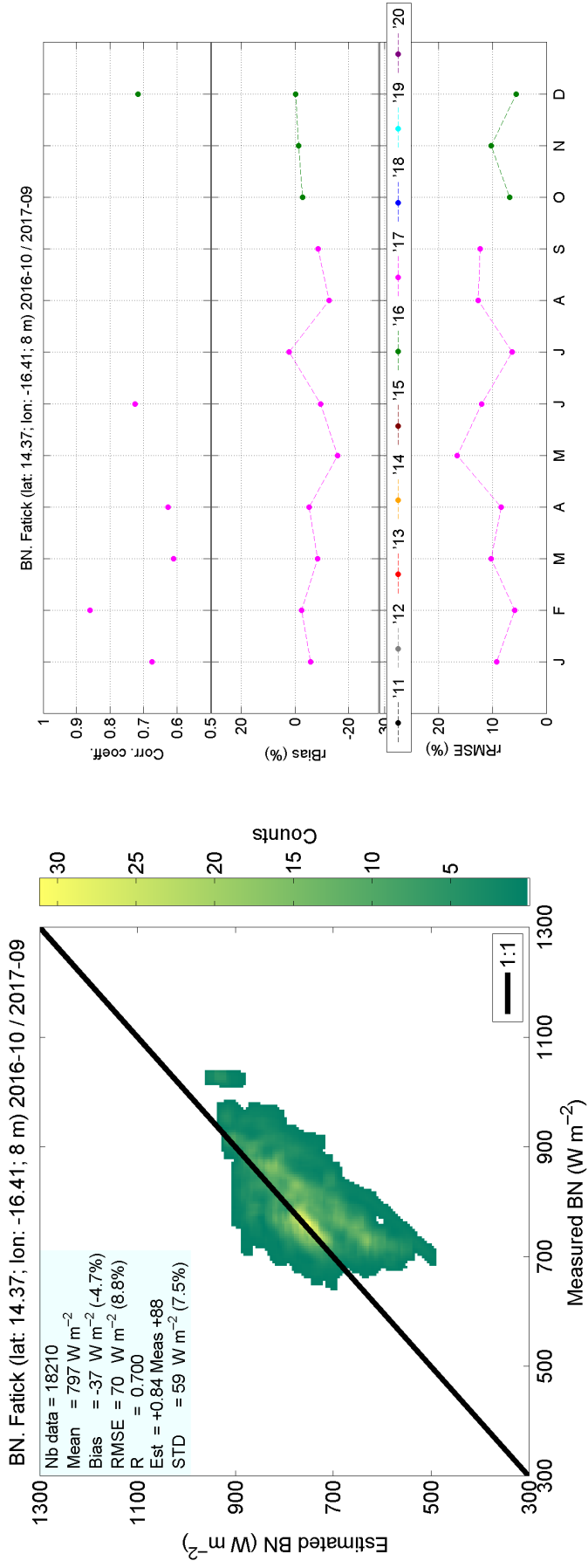


Figure S6: Comparison on direct component at normal irradiance at Fatick

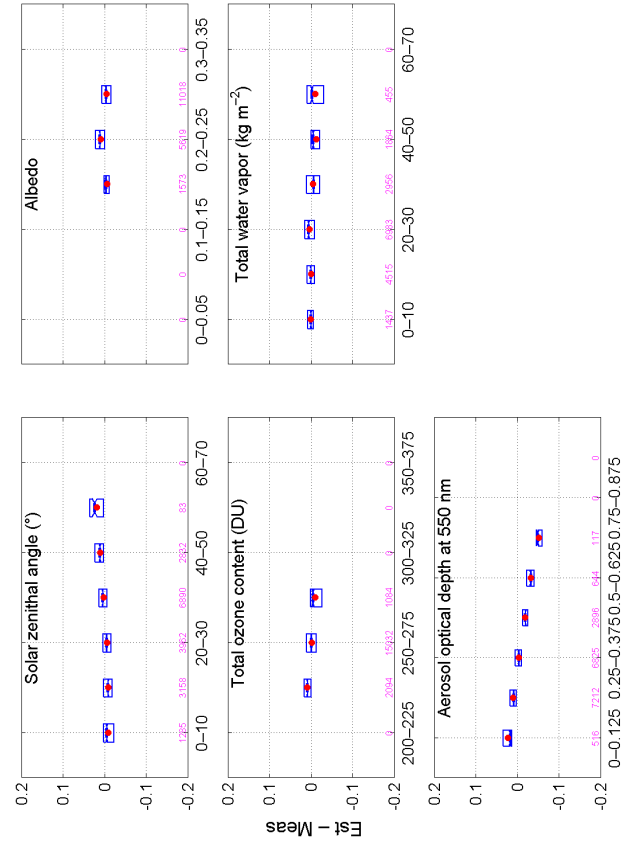
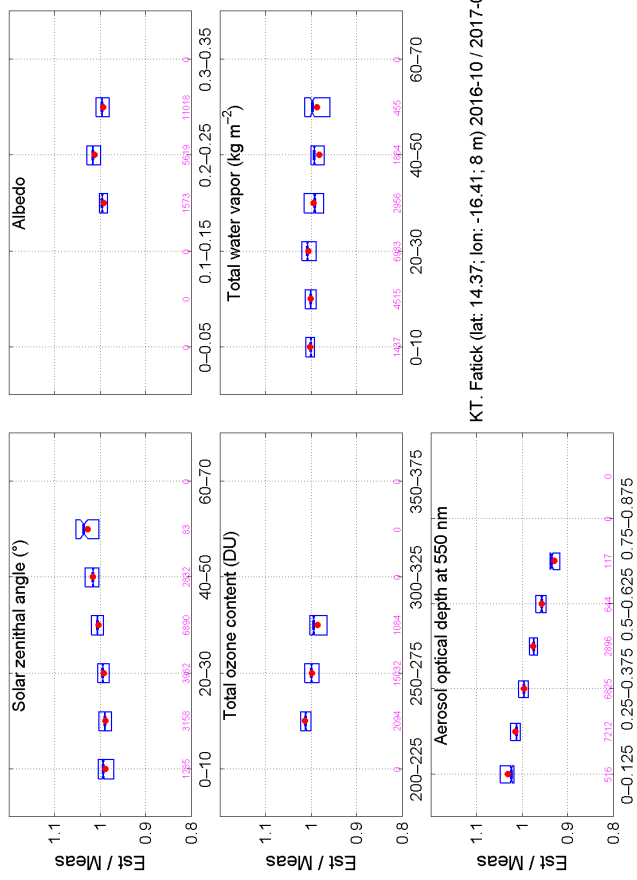
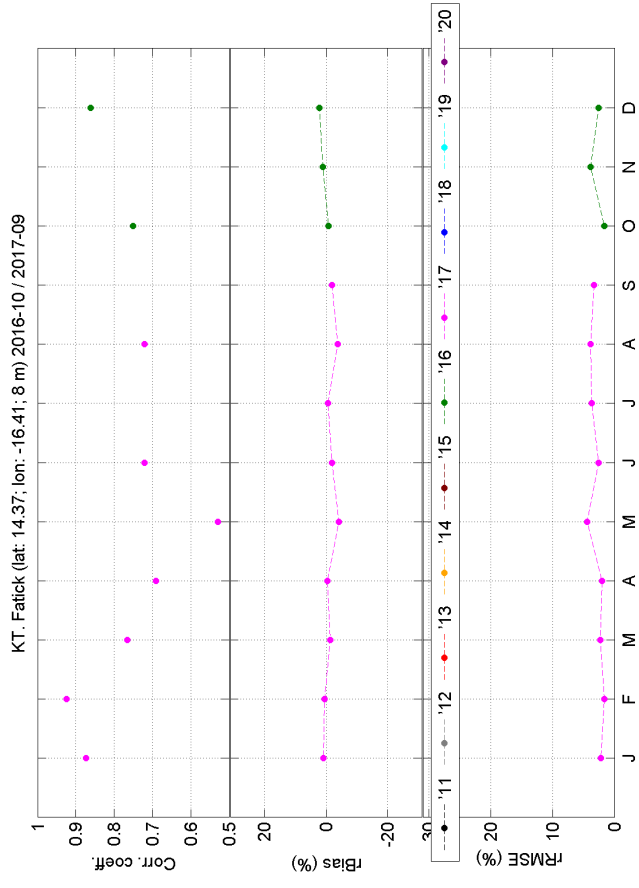
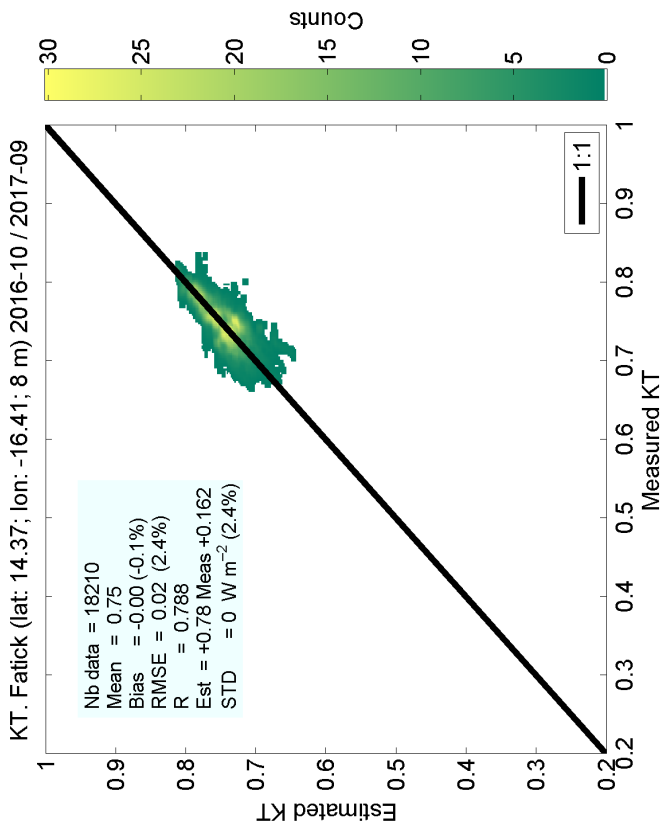


Figure S7: Comparison on clearness index at Fatick

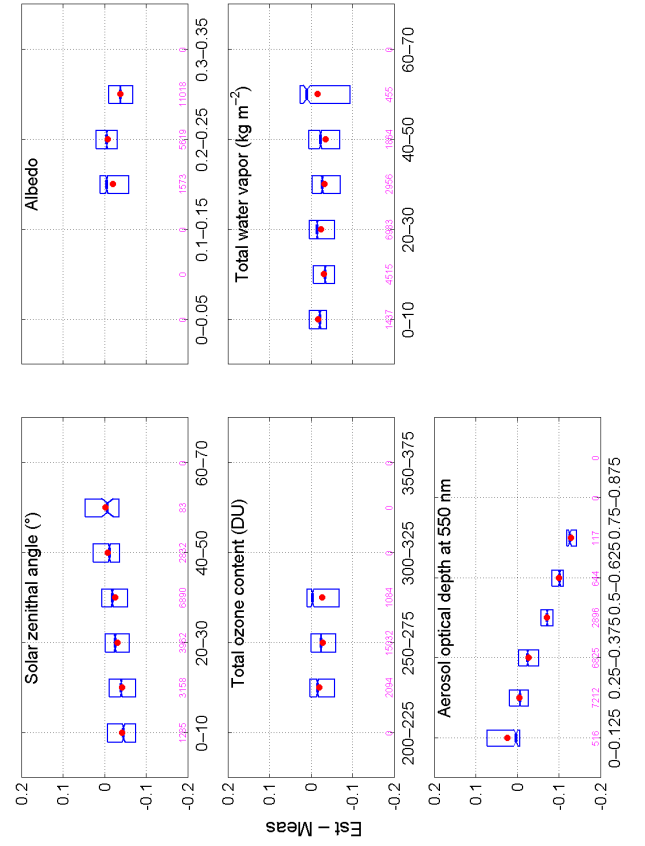
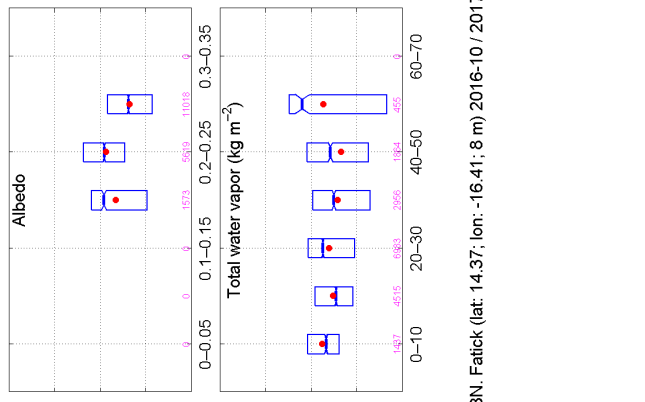
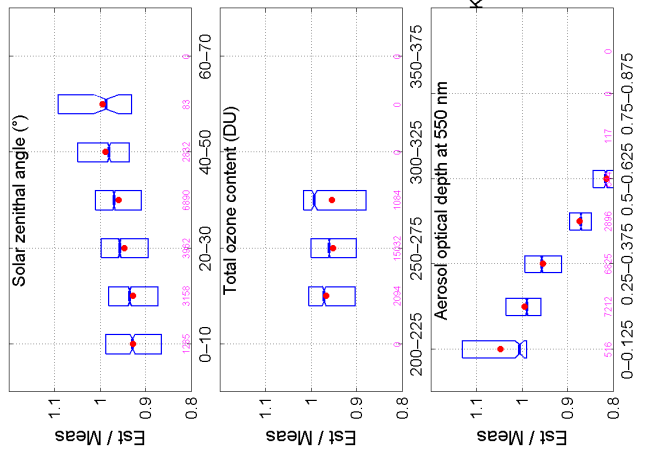
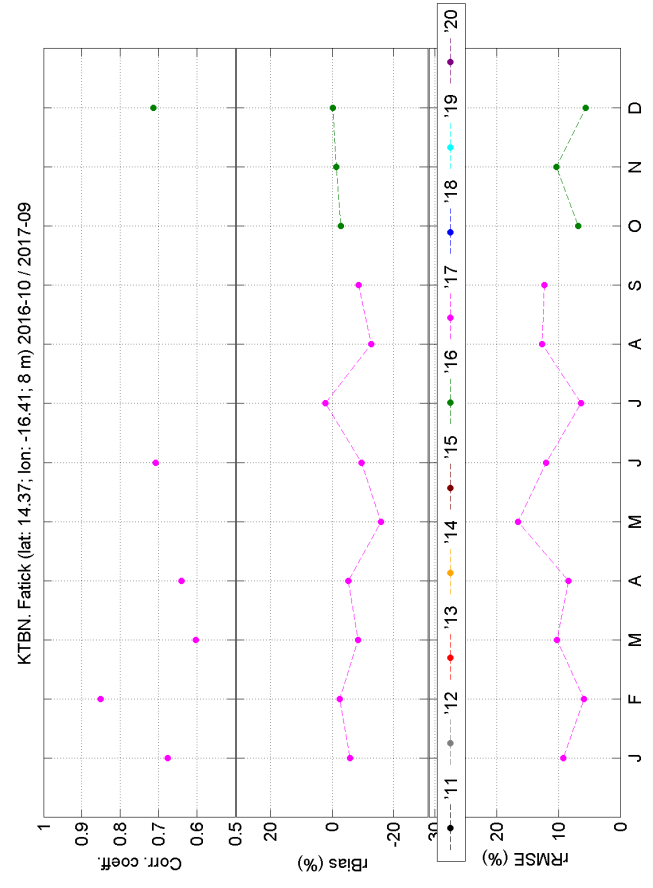
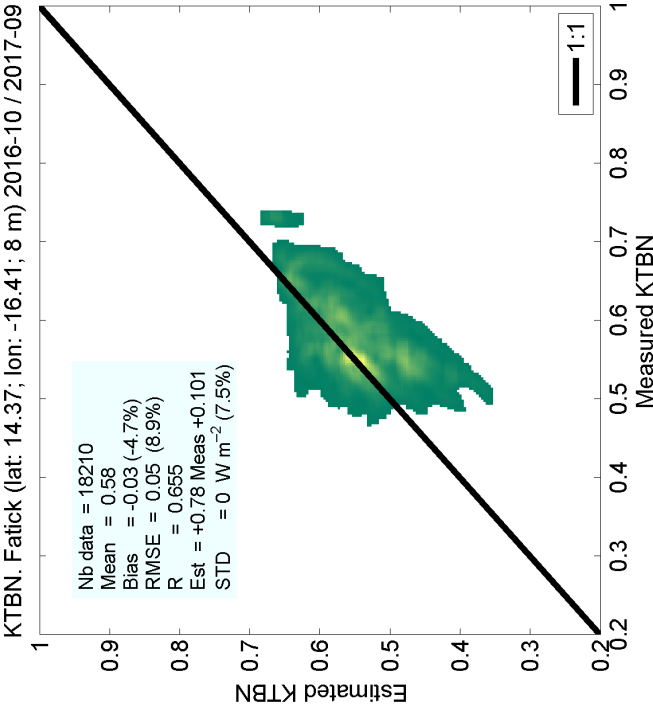


Figure S8: Comparison on direct clearness index at Fatick

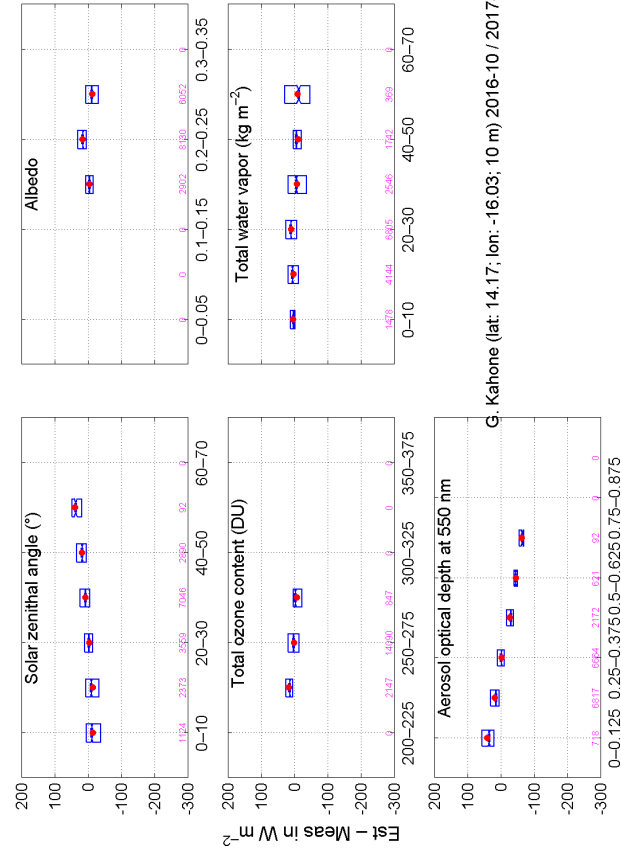
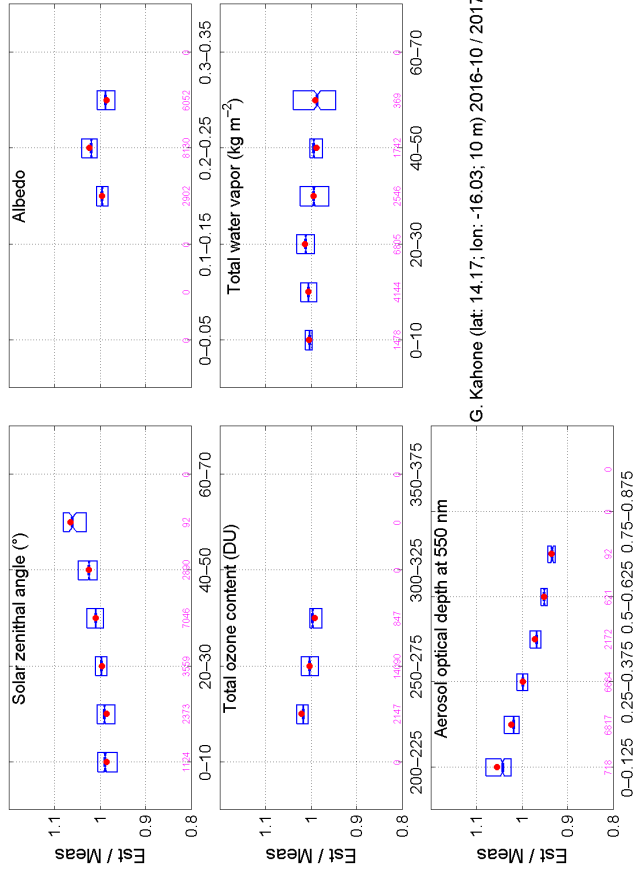
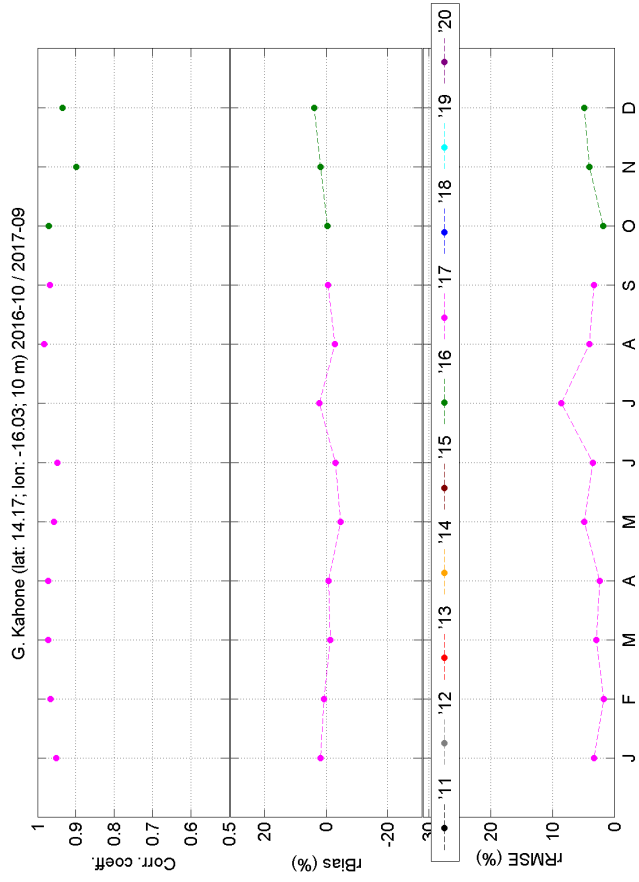
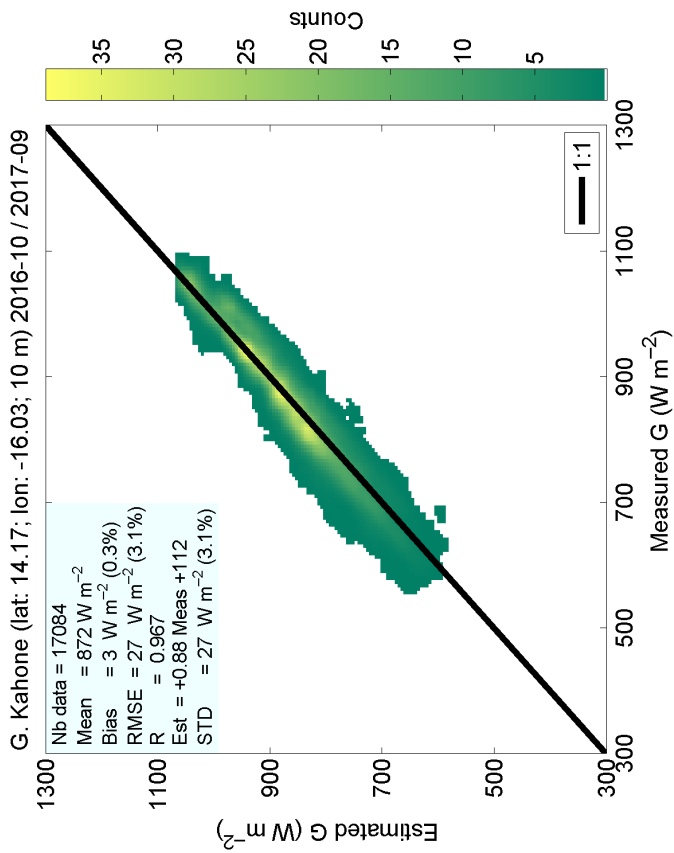
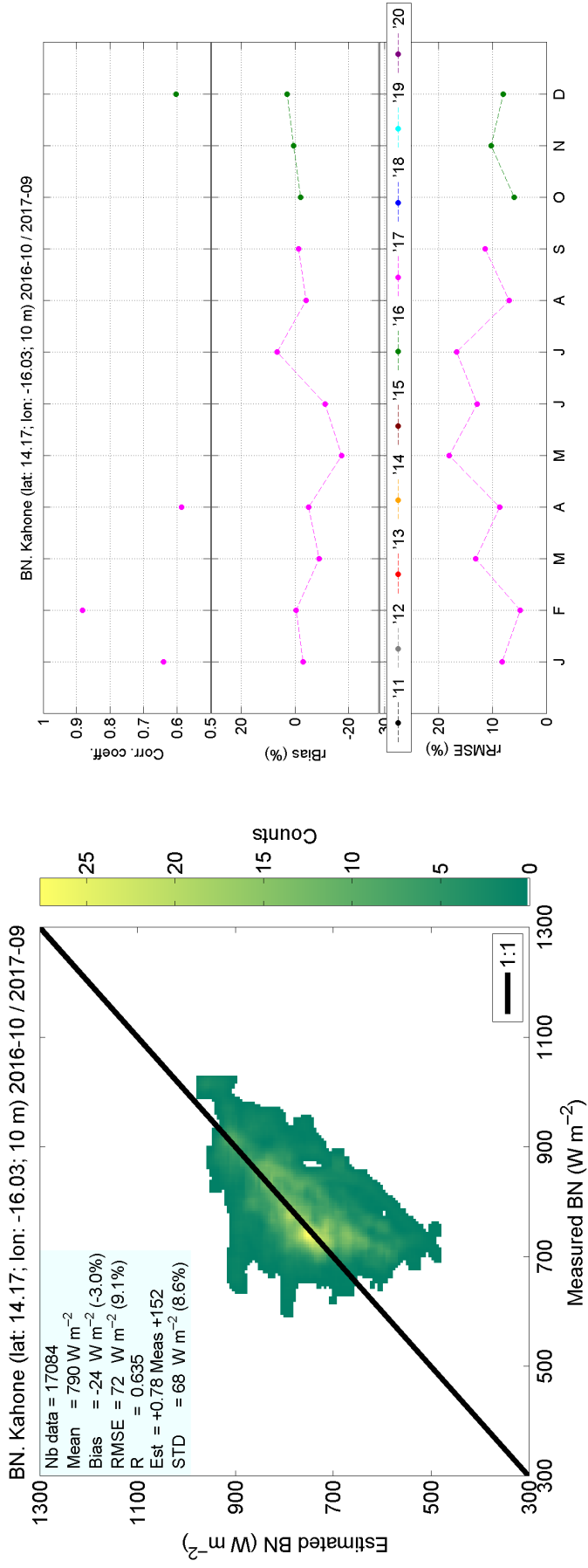
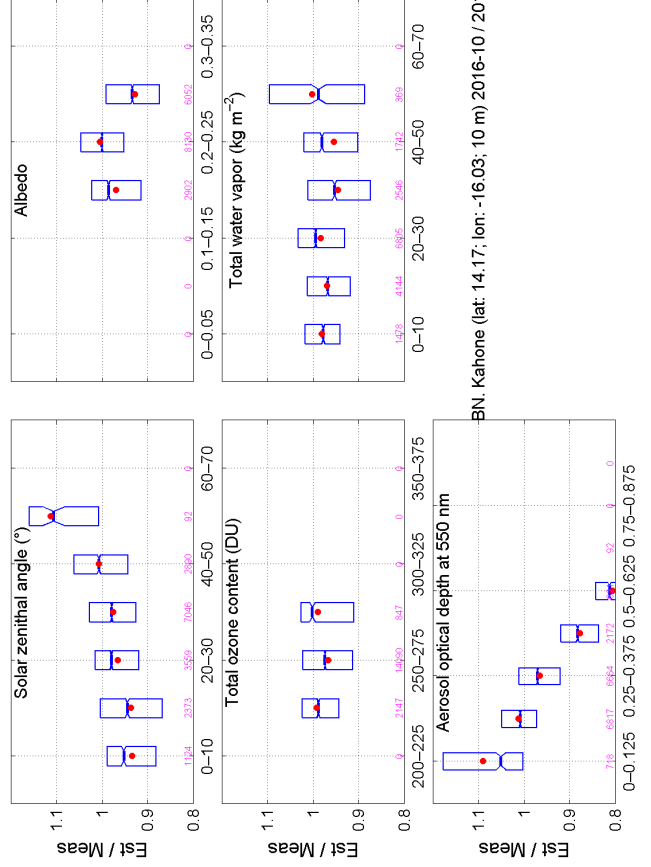
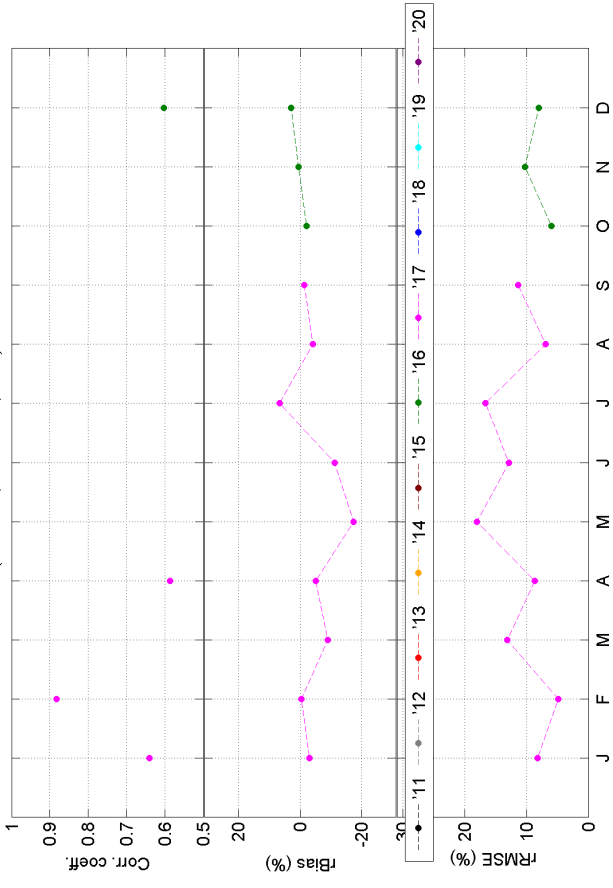


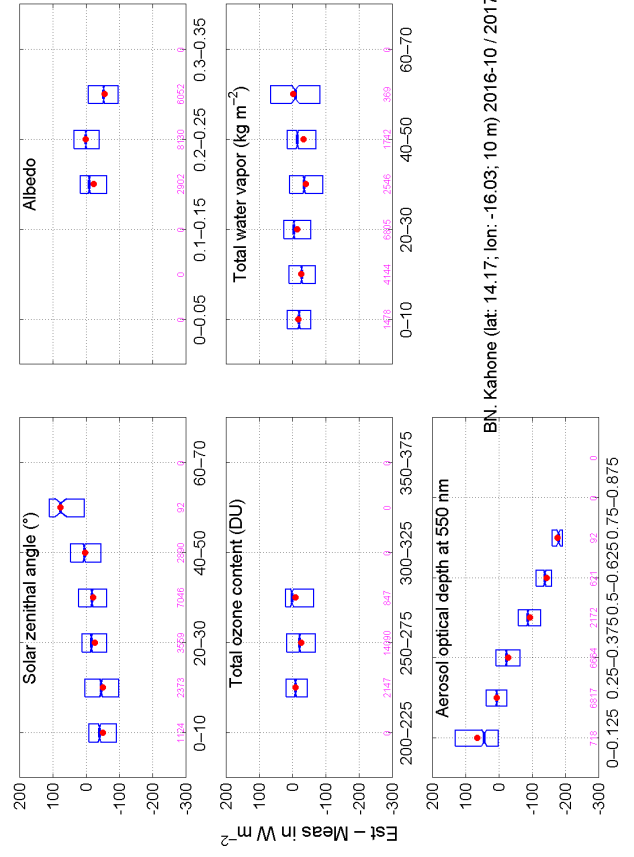
Figure S9: Comparison on global irradiance at Kahone



BN, Kahone (lat: 14.17; lon: -16.03; 10 m) 2016-10 / 2017-09

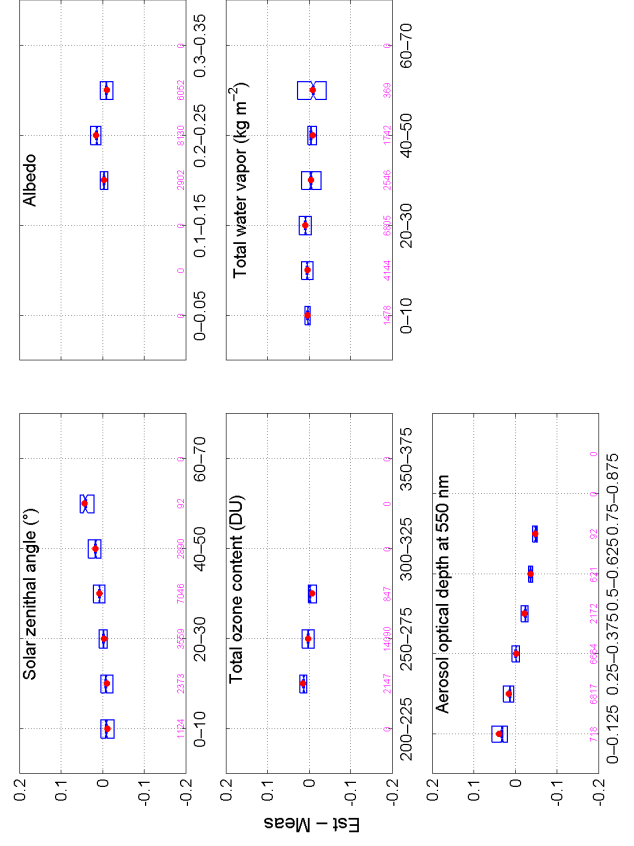
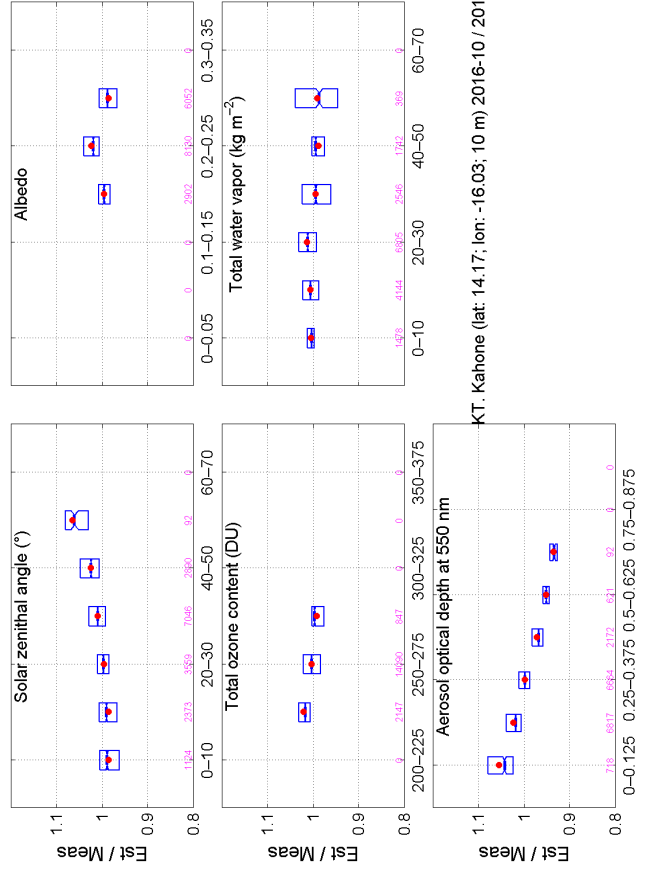
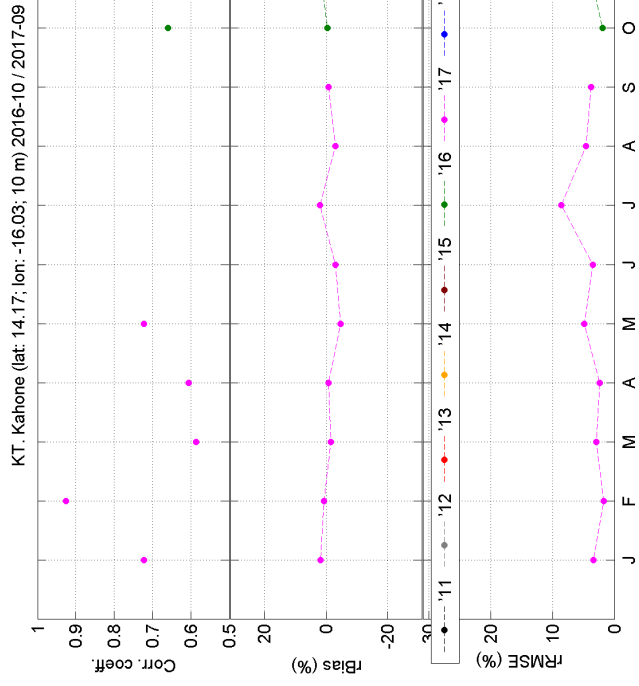
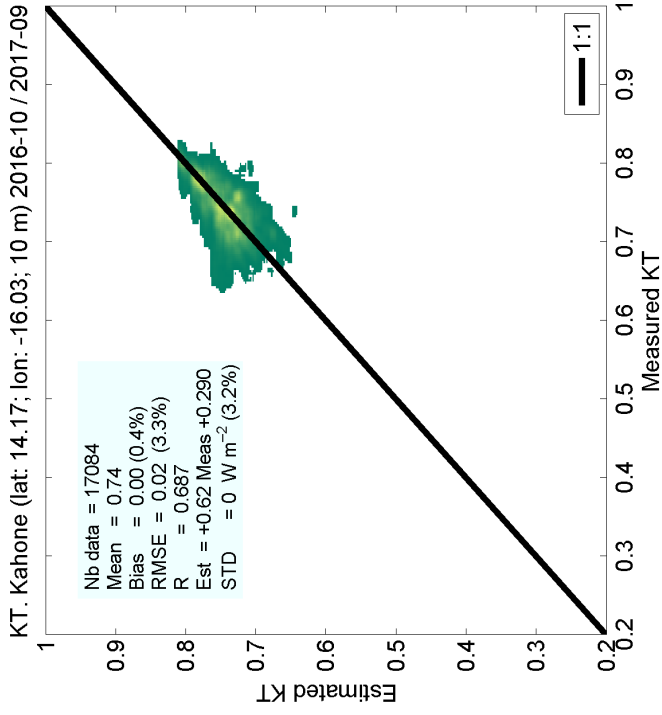


BN, Kahone (lat: 14.17; lon: -16.03; 10 m) 2016-10 / 2017-09



BN, Kahone (lat: 14.17; lon: -16.03; 10 m) 2016-10 / 2017-09

Figure S10: Comparison on direct component at normal irradiance at Kahone



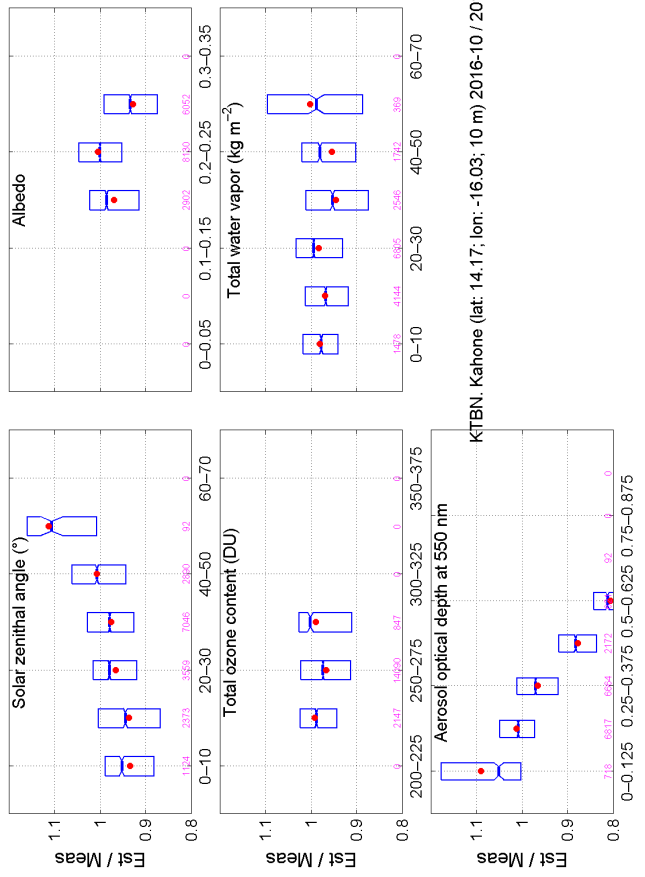
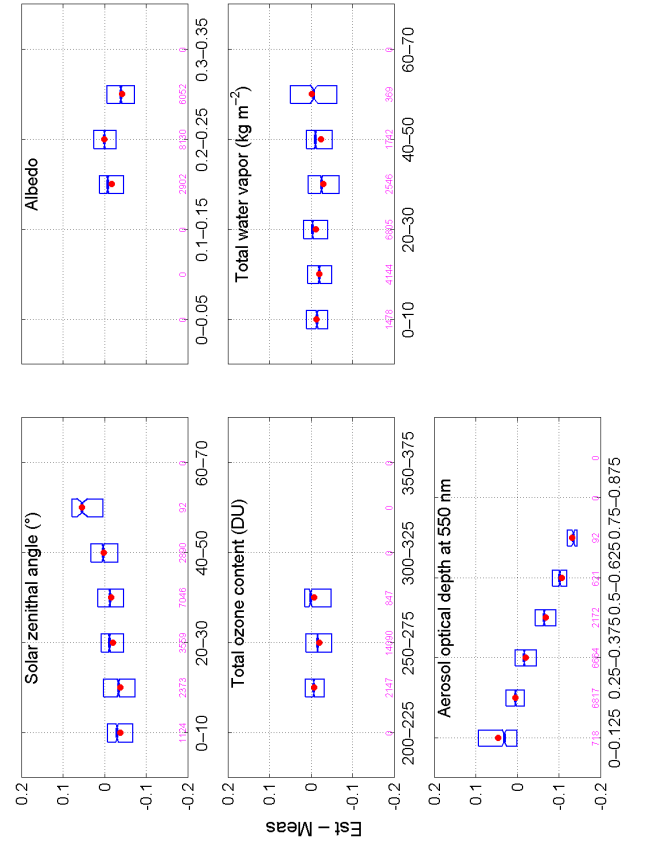
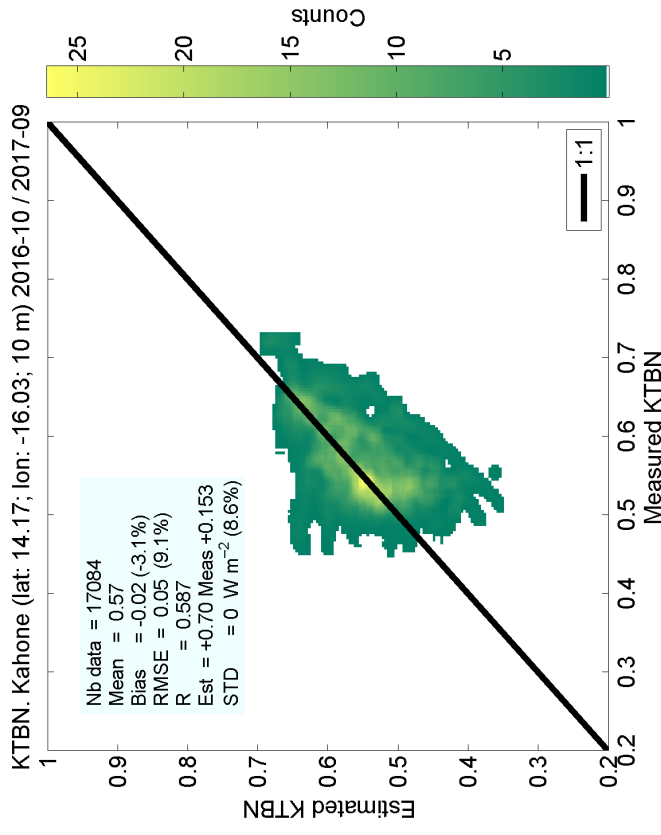
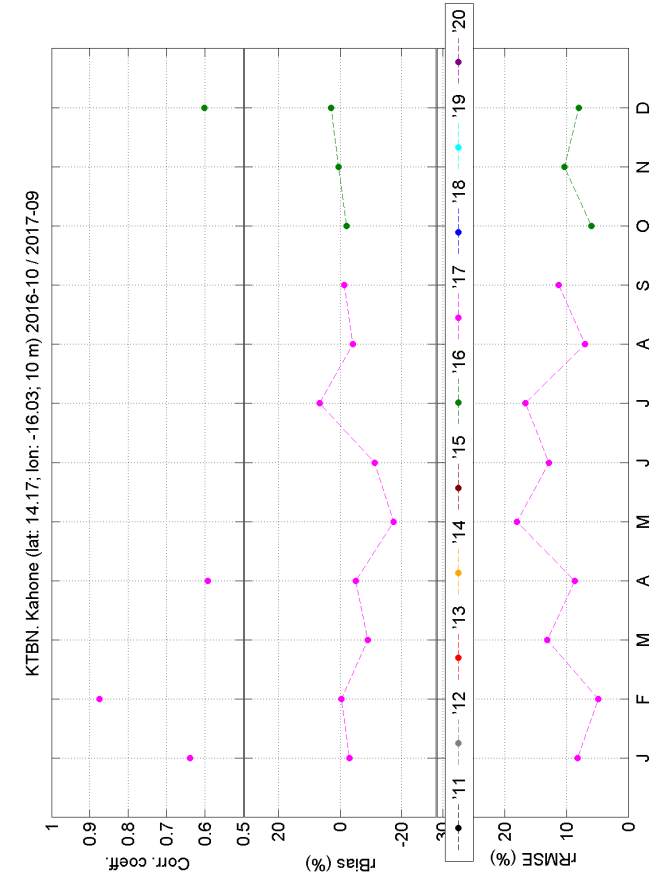


Figure S12: Comparison on direct clearness index at Kahone

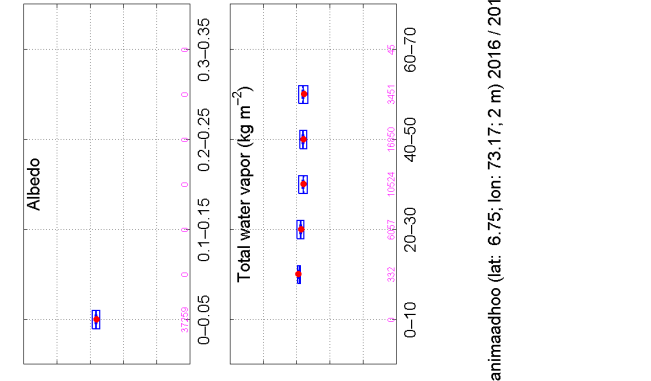
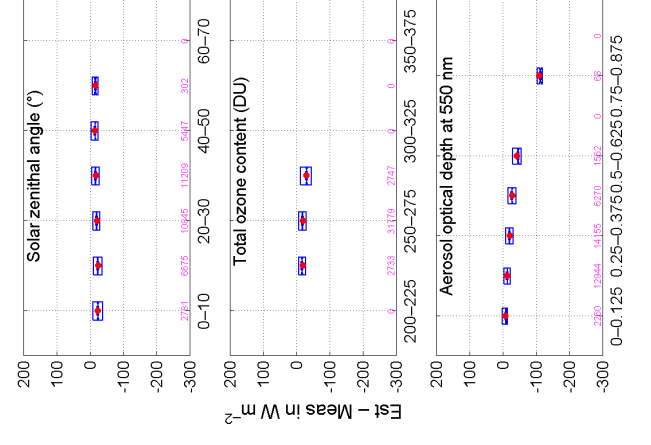
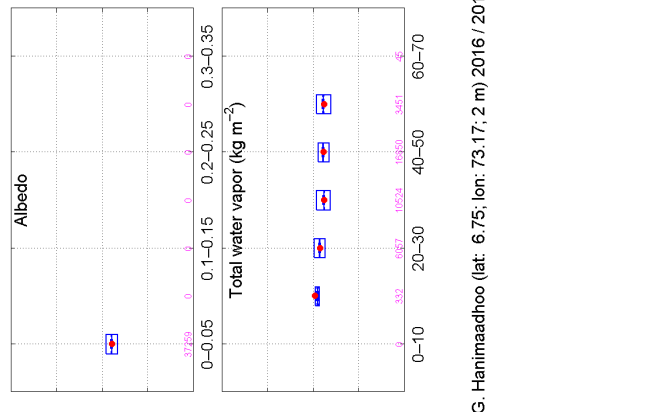
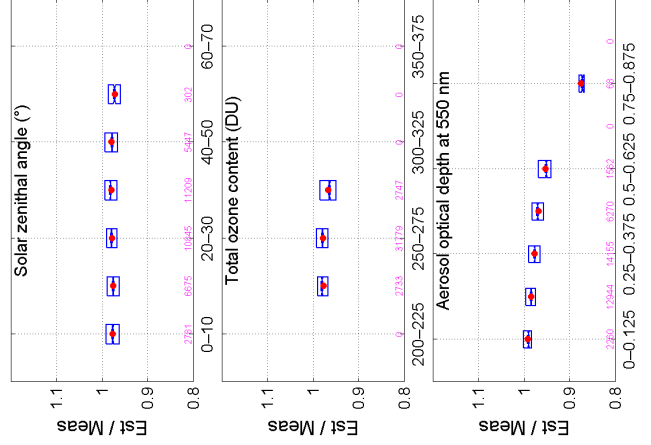
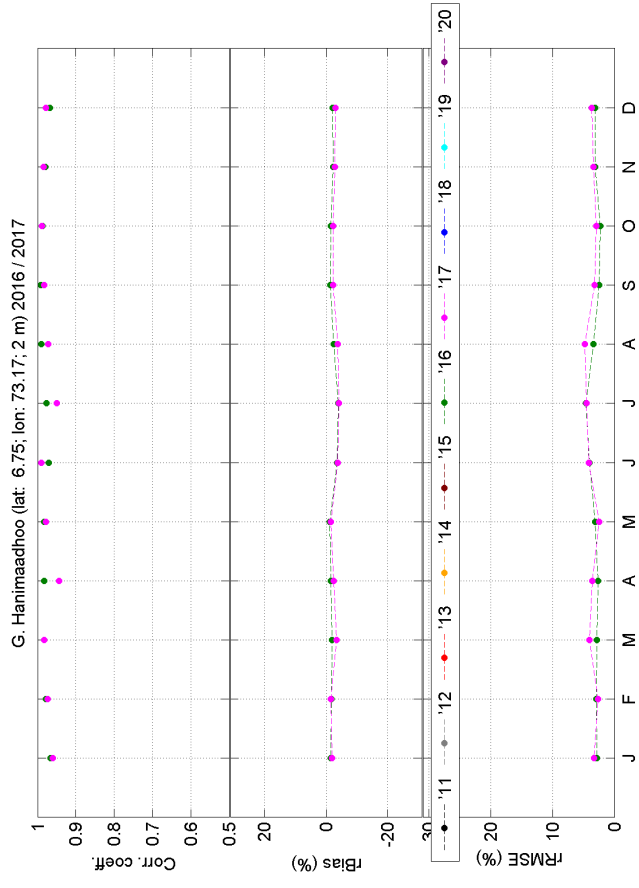
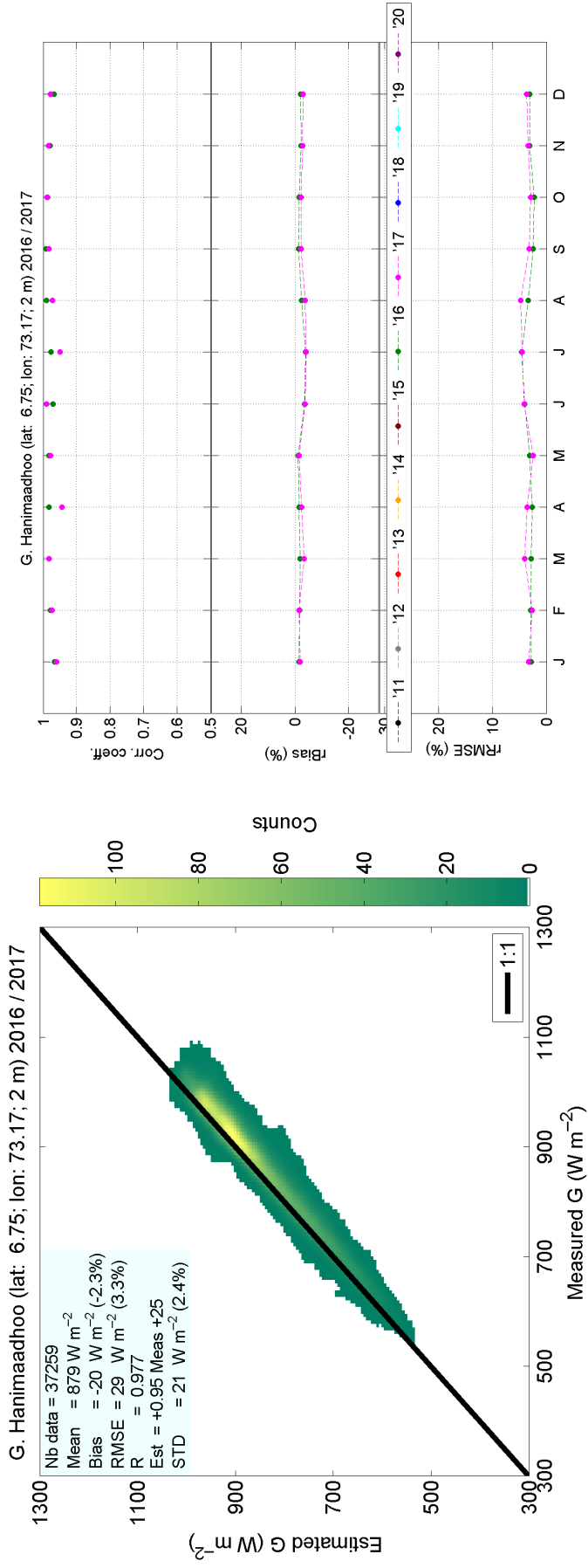


Figure S13: Comparison on global irradiance at Hanimaadhoo

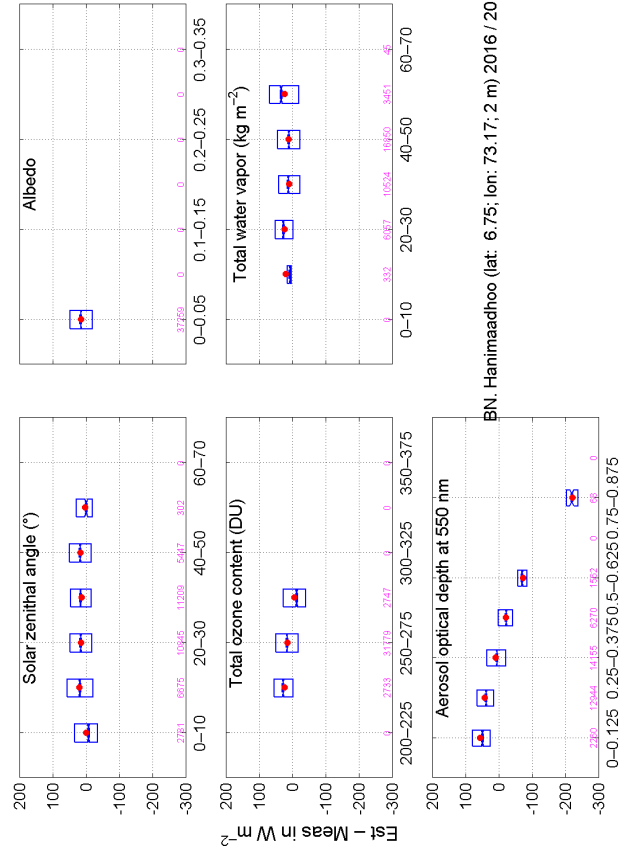
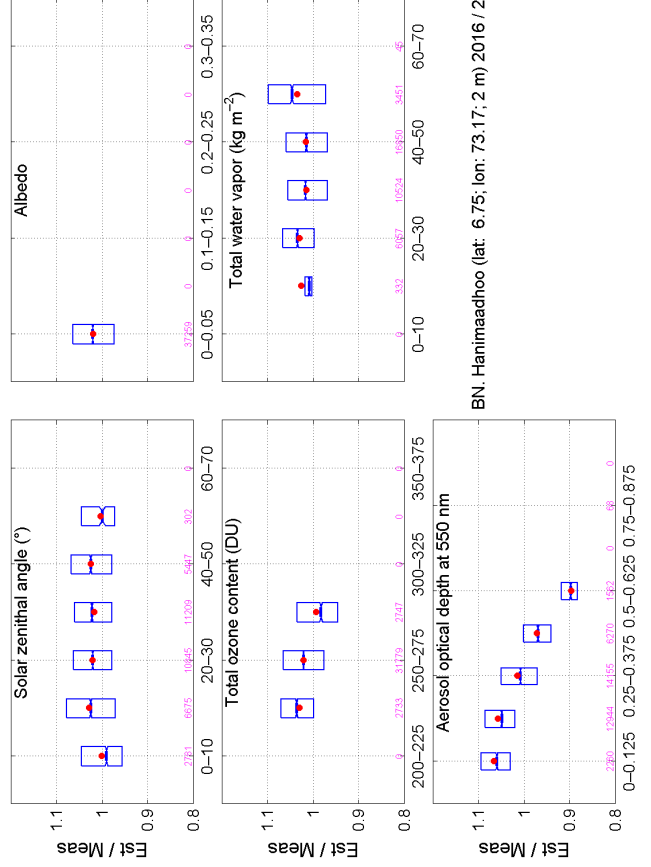
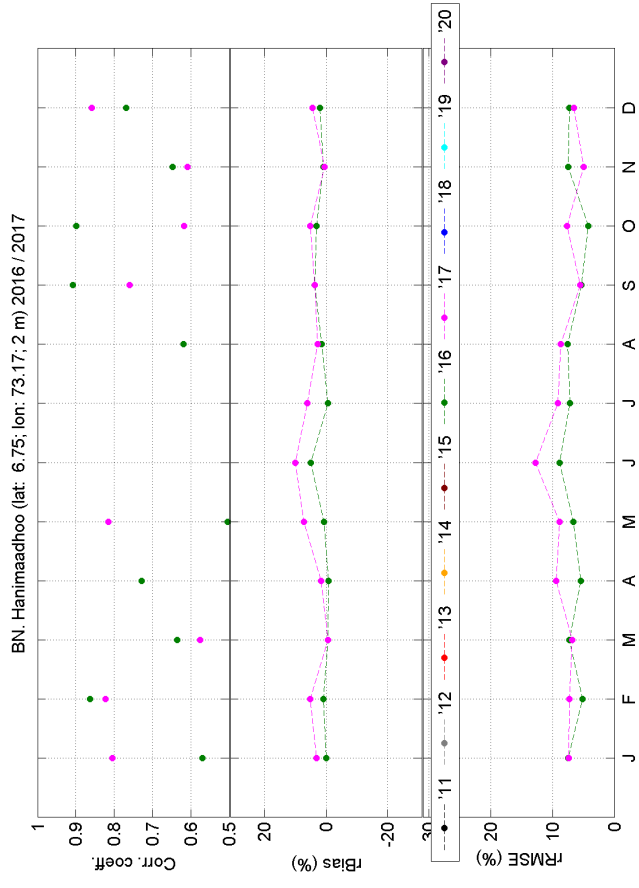
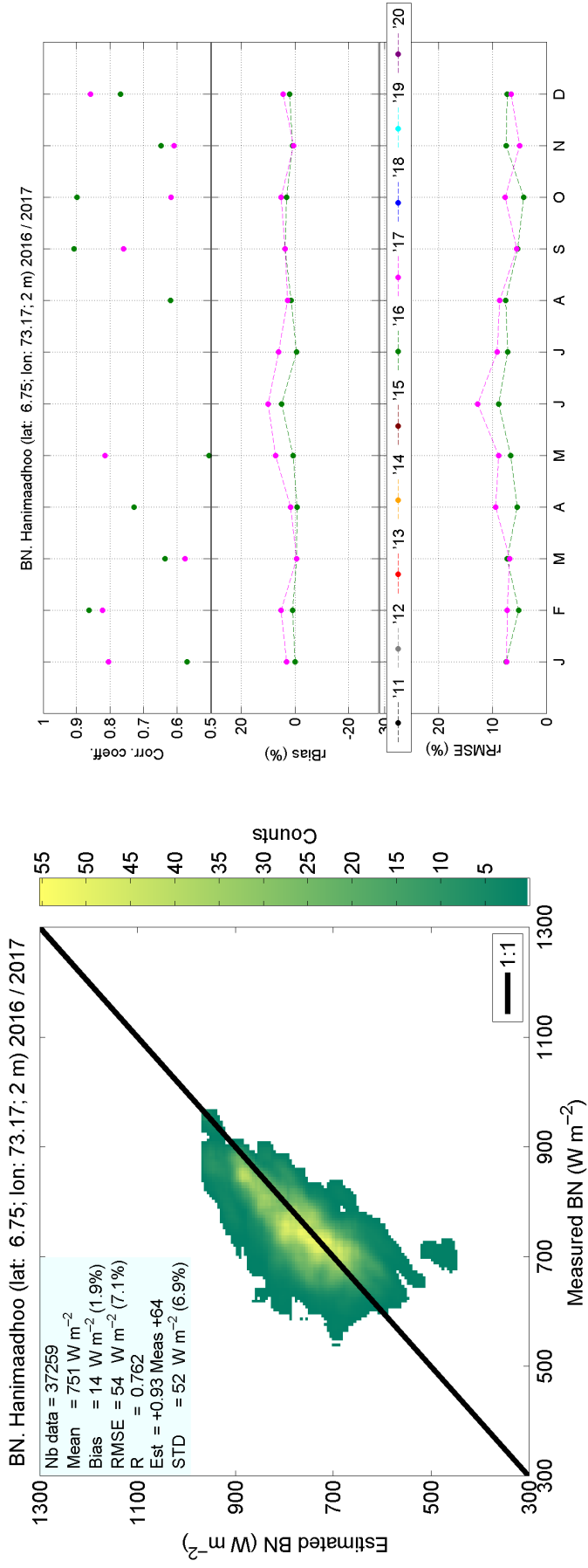


Figure S14: Comparison on direct component at normal irradiance at Hanimaadhoo

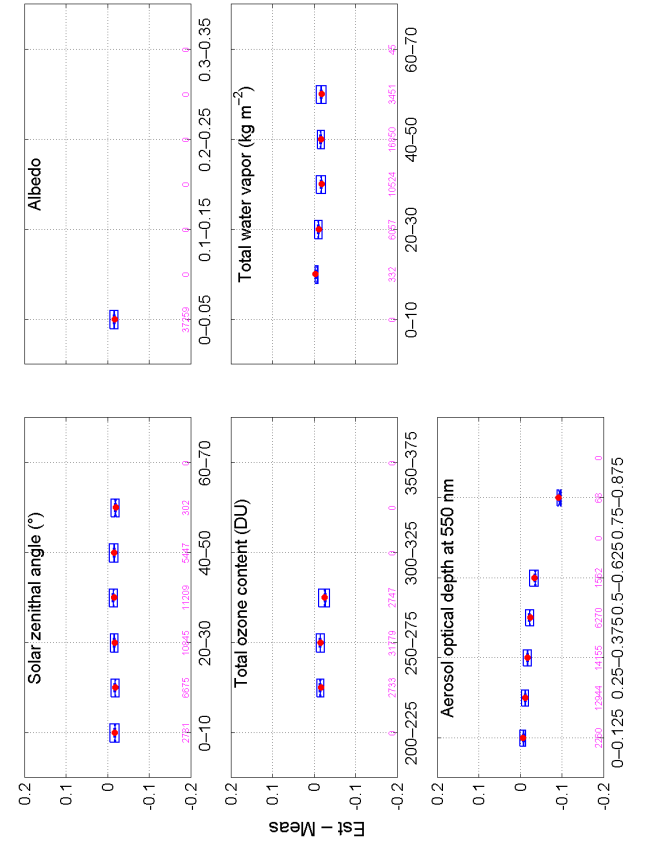
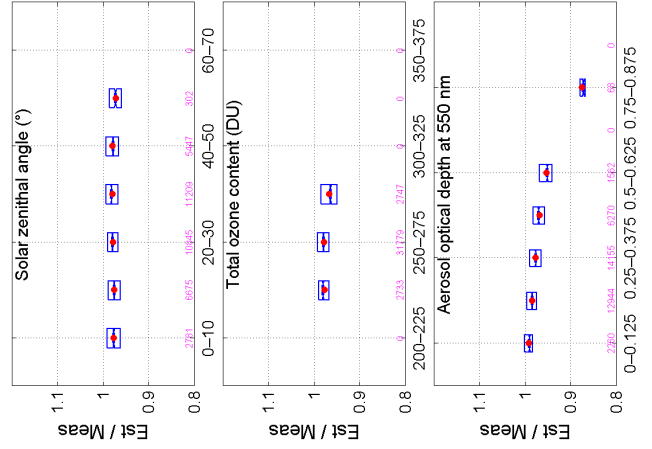
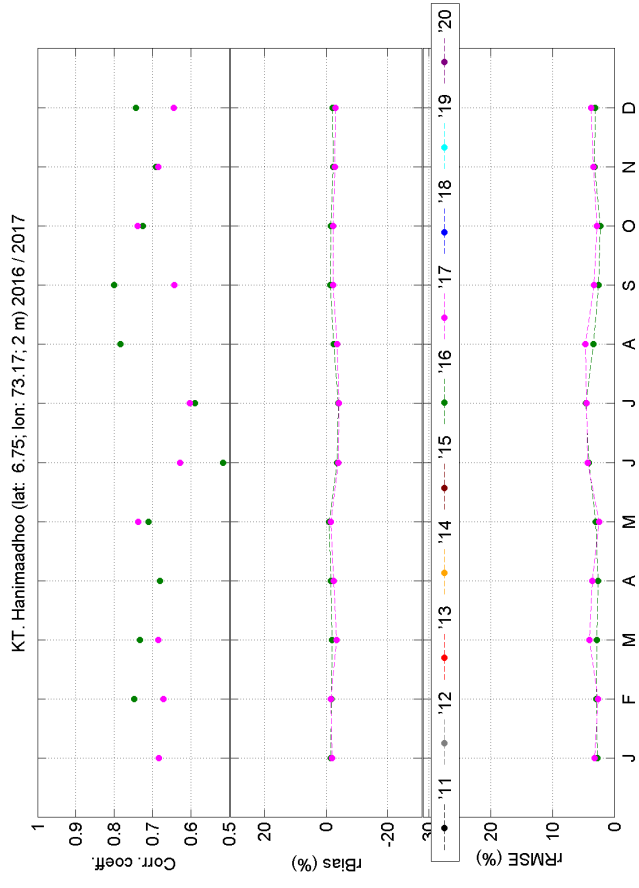
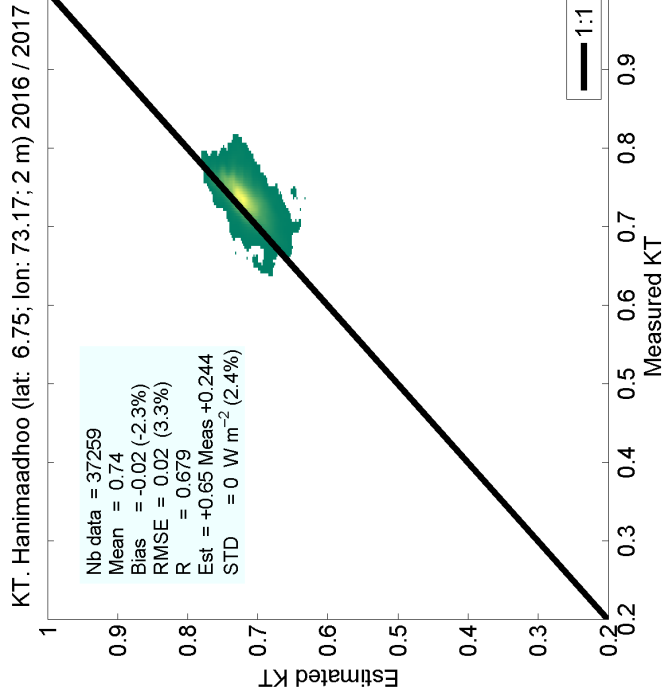


Figure S15: Comparison on clearness index at Hanimaadhoo

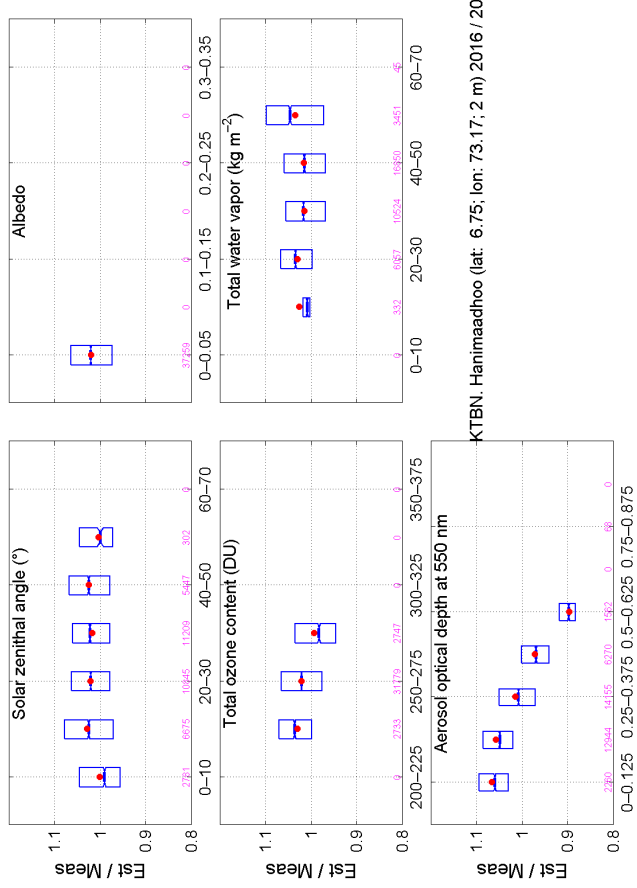
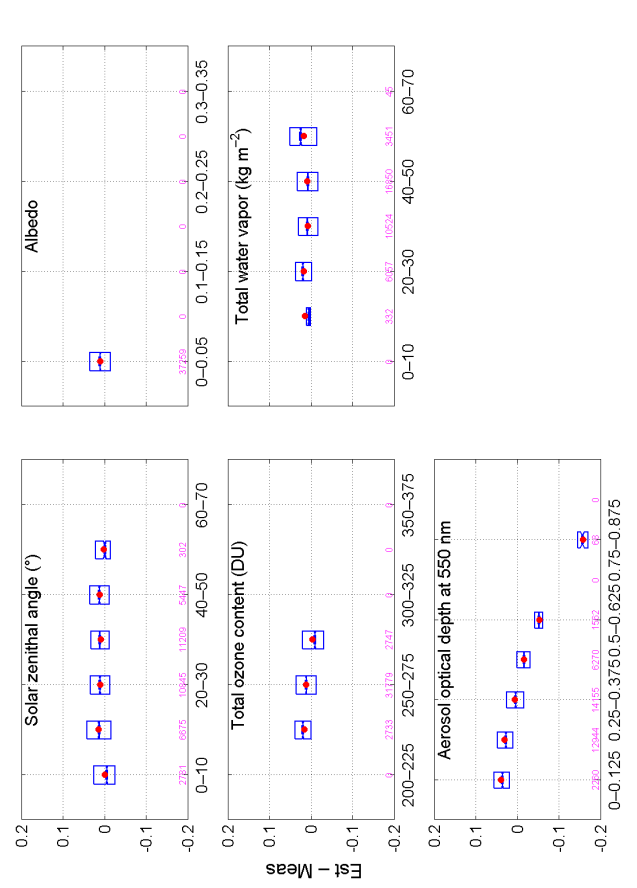
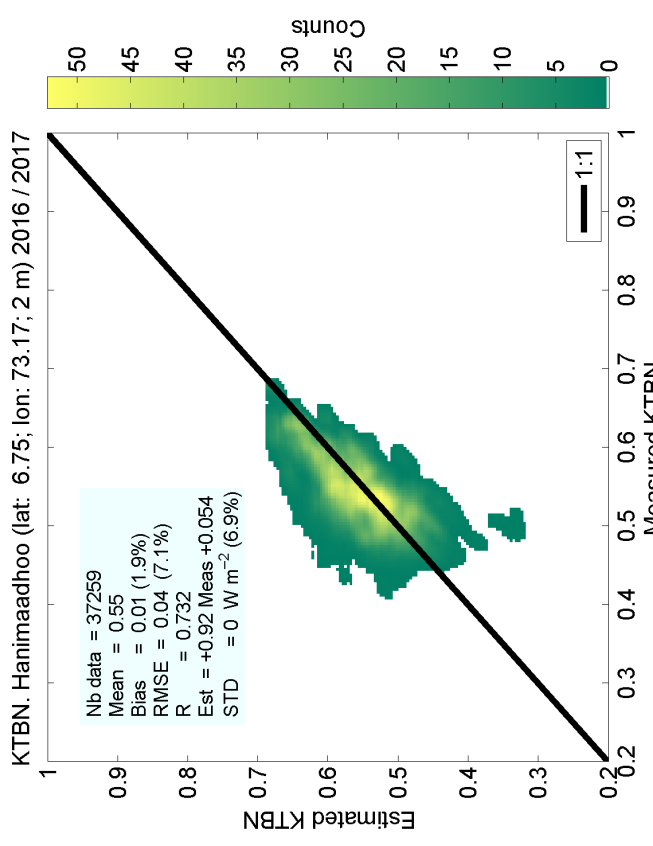
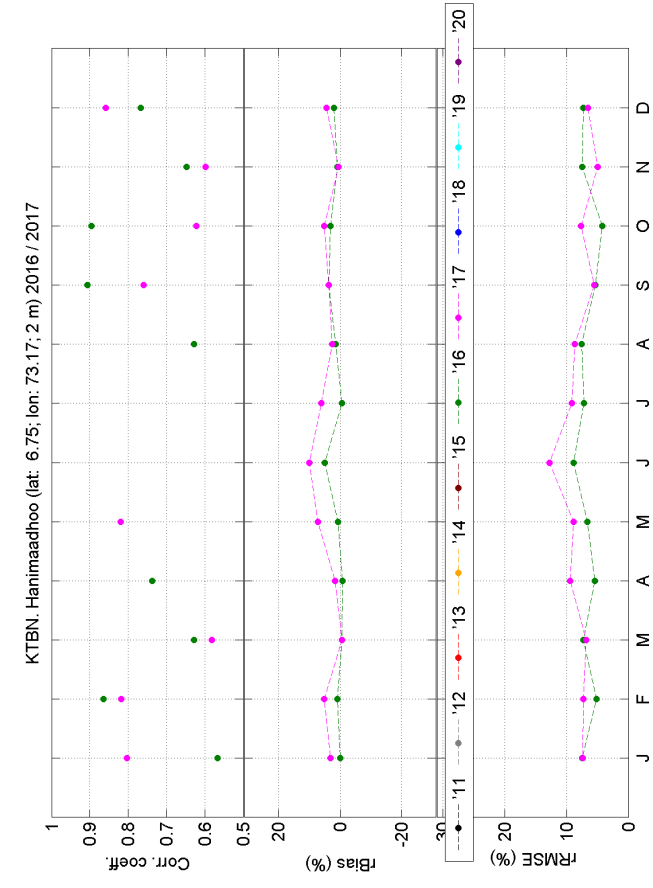


Figure S16: Comparison on direct clearness index at Hanimaadhoo

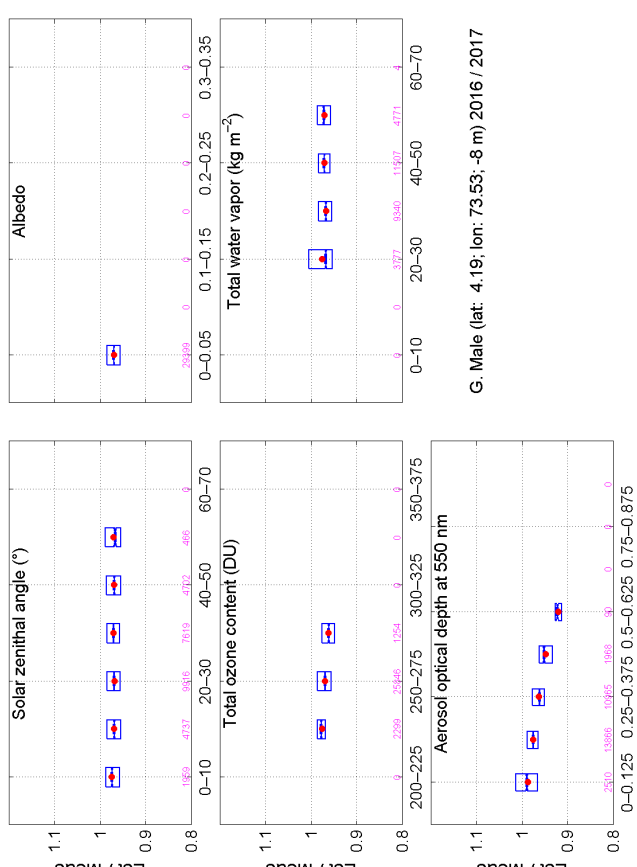
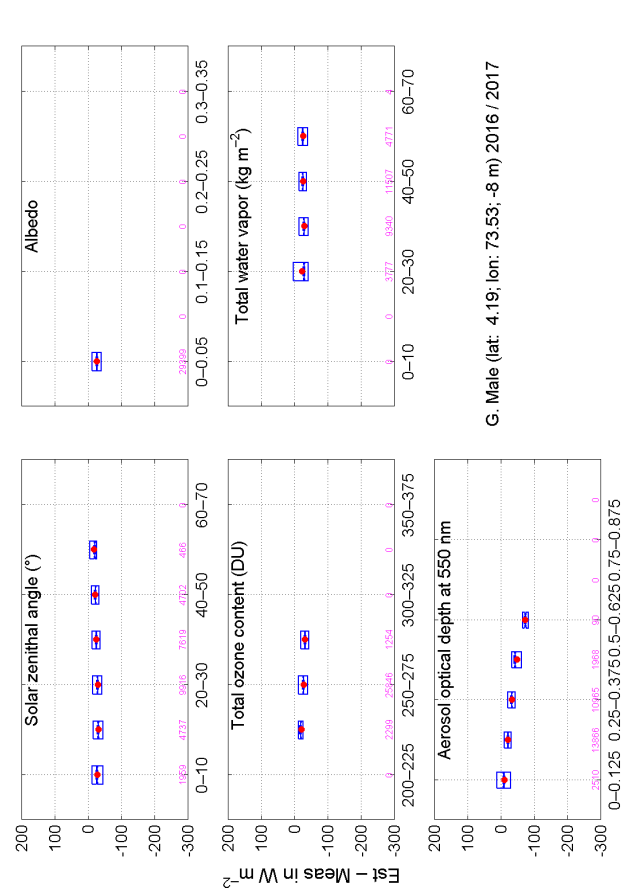
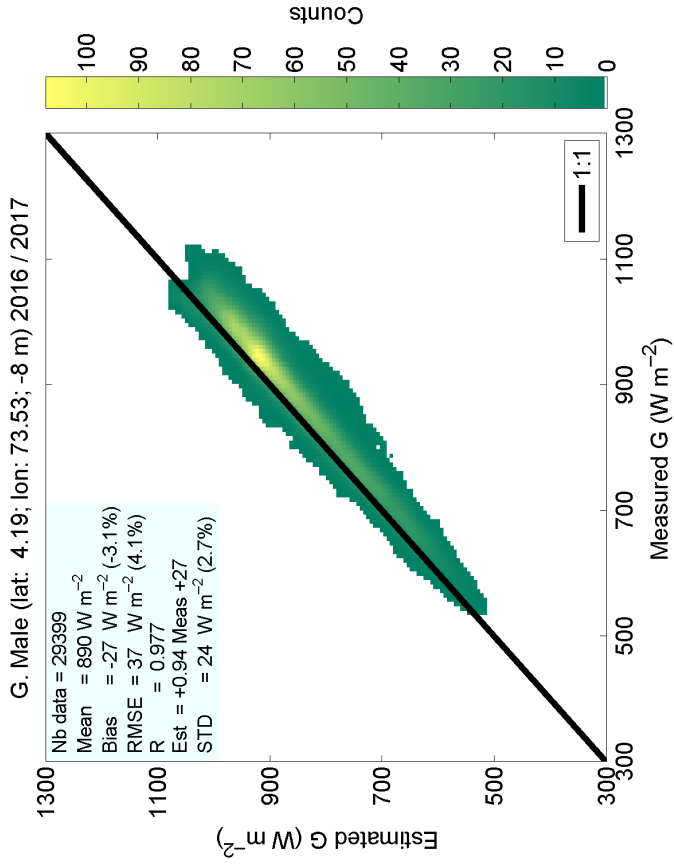
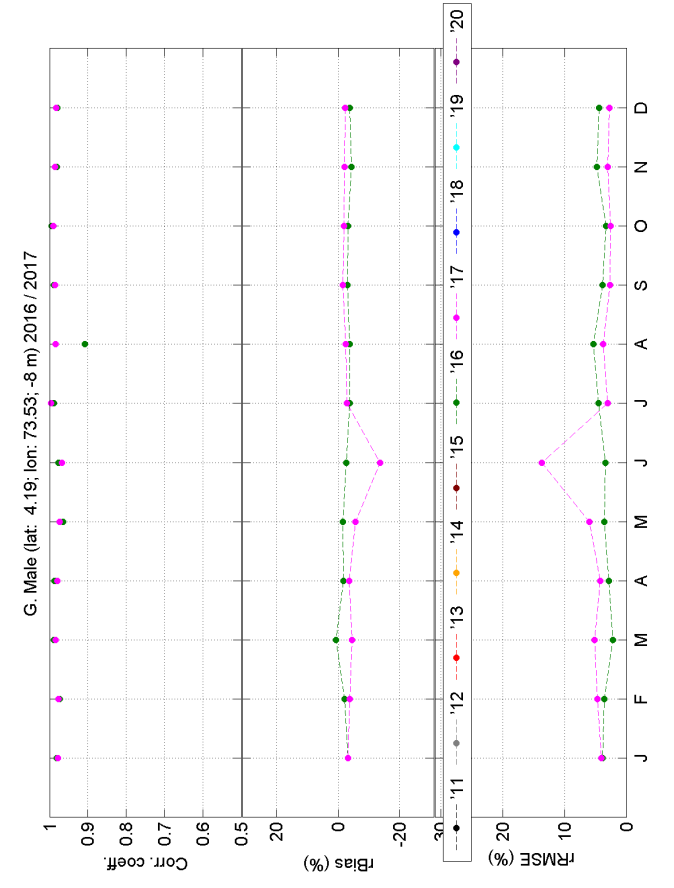


Figure S17: Comparison on global irradiance at Male

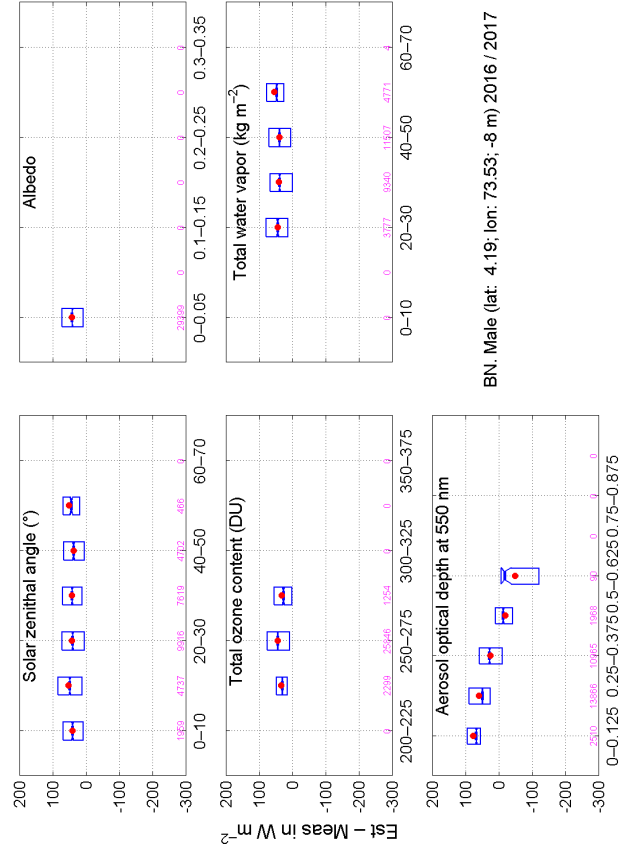
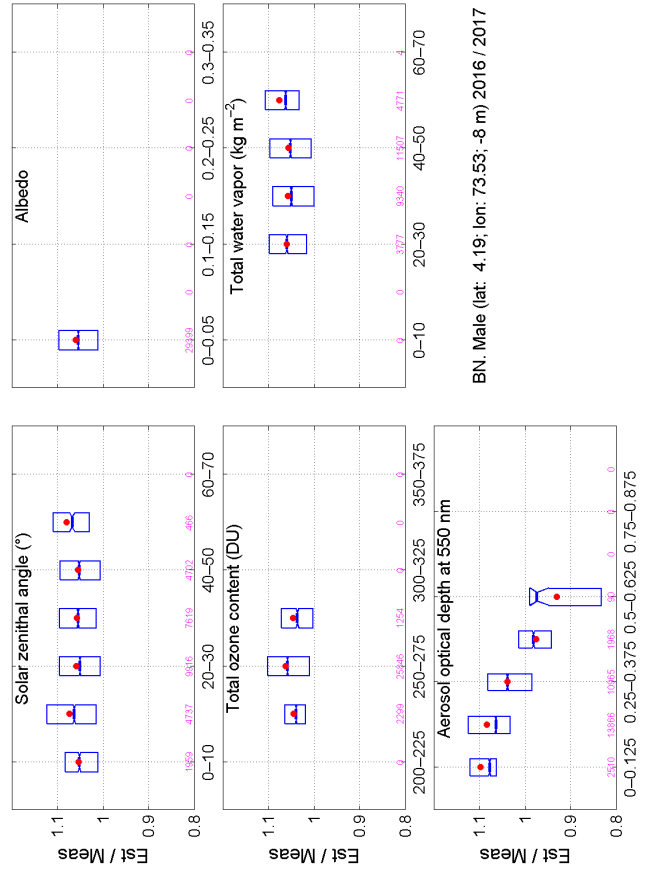
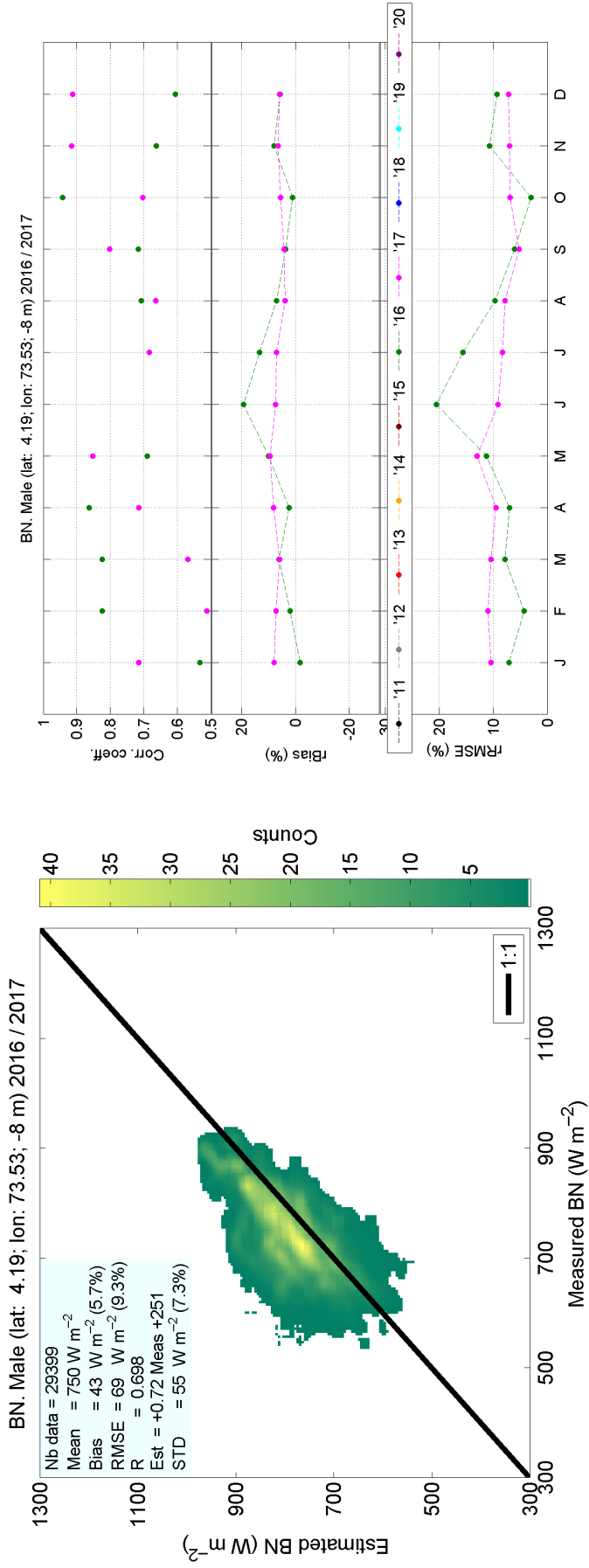
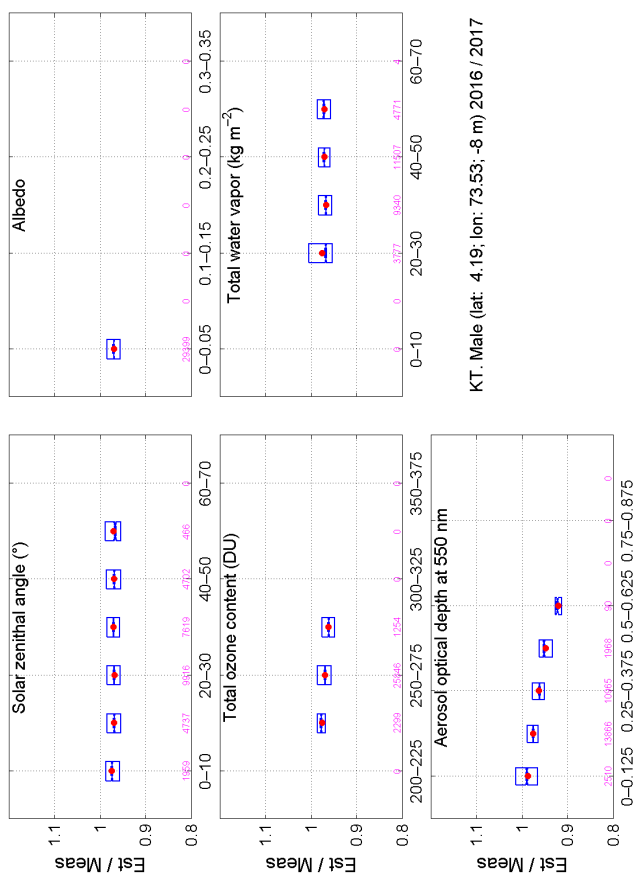
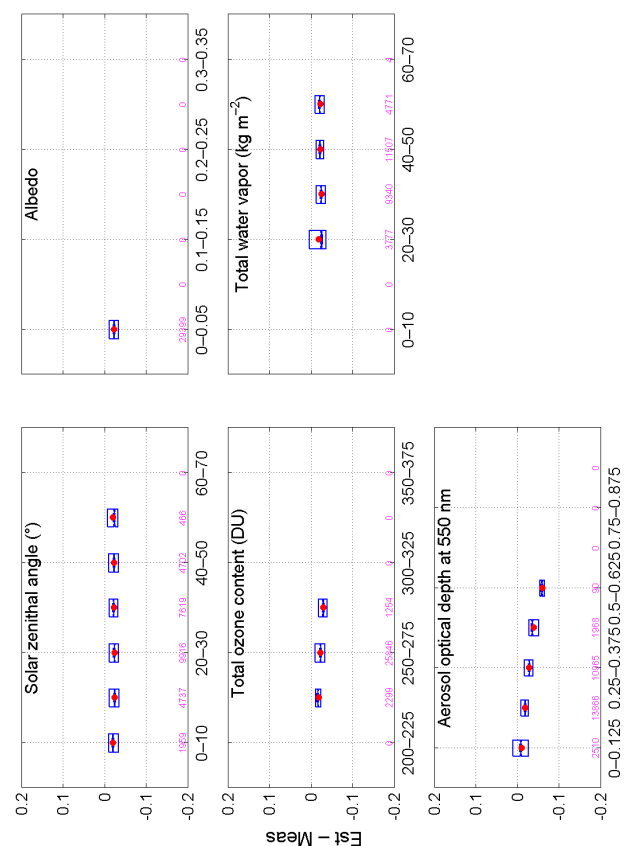
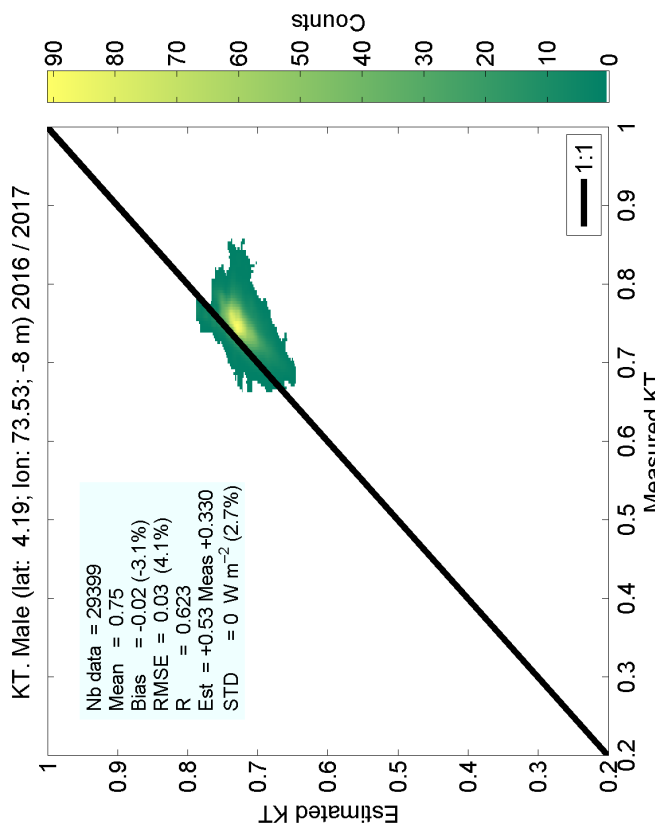
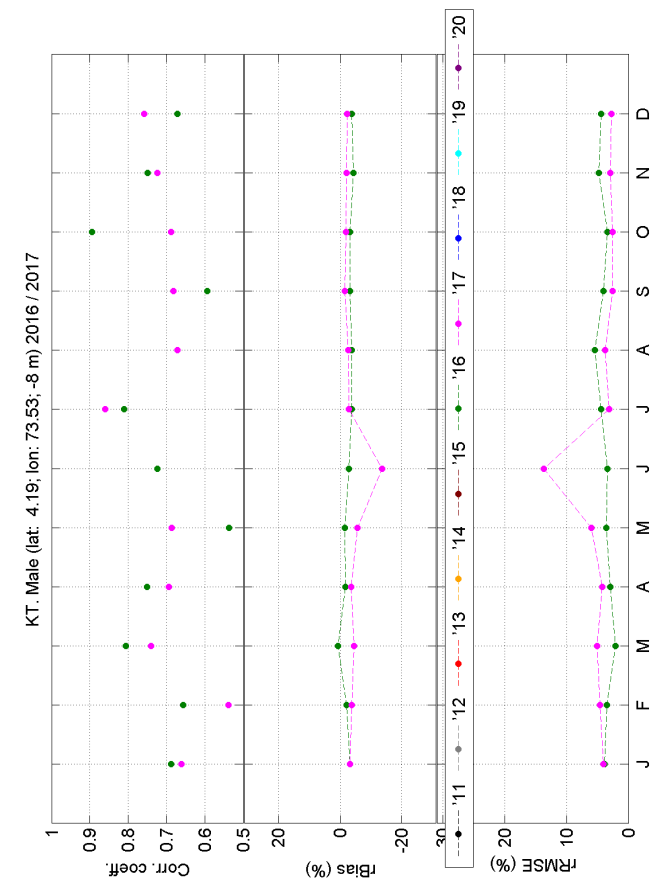


Figure S18: Comparison on direct component at normal irradiance at Male



KT. Male (lat: 4.19; lon: 73.53; -8 m) 2016 / 2017

Figure S19: Comparison on clearness index at Male

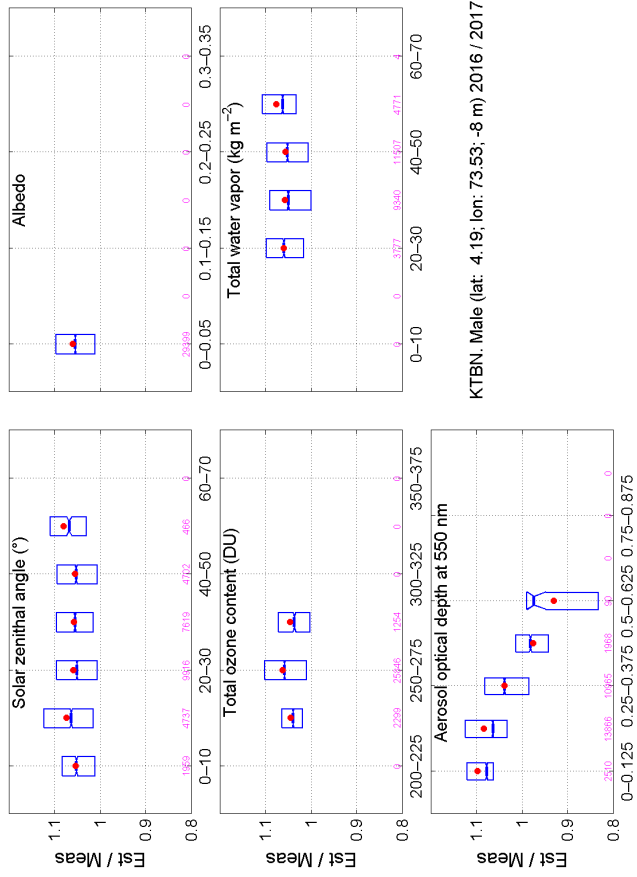
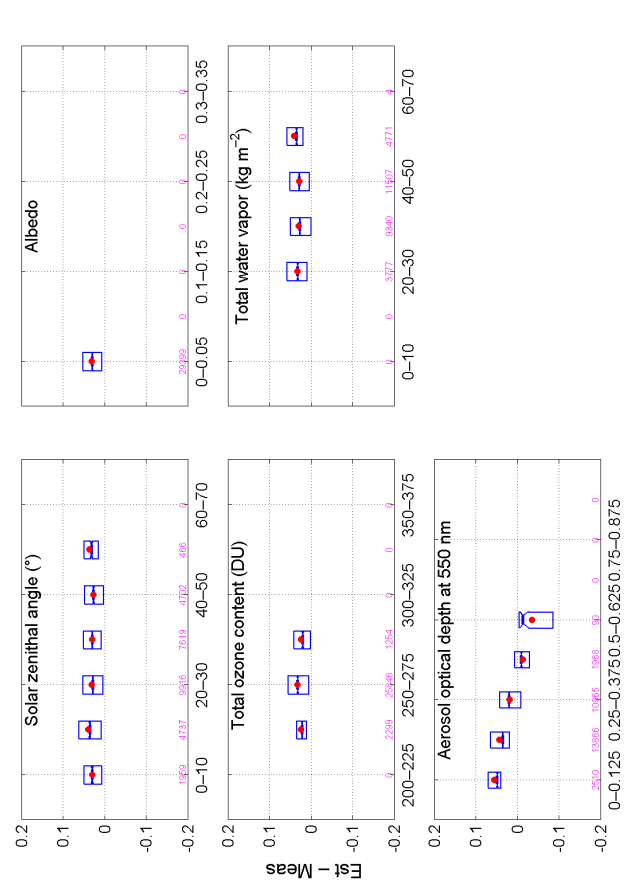
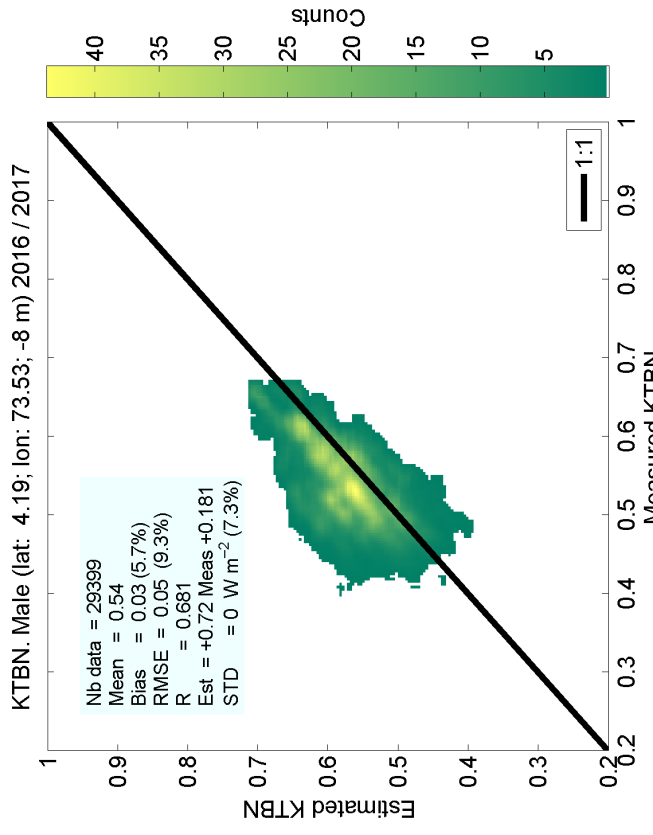
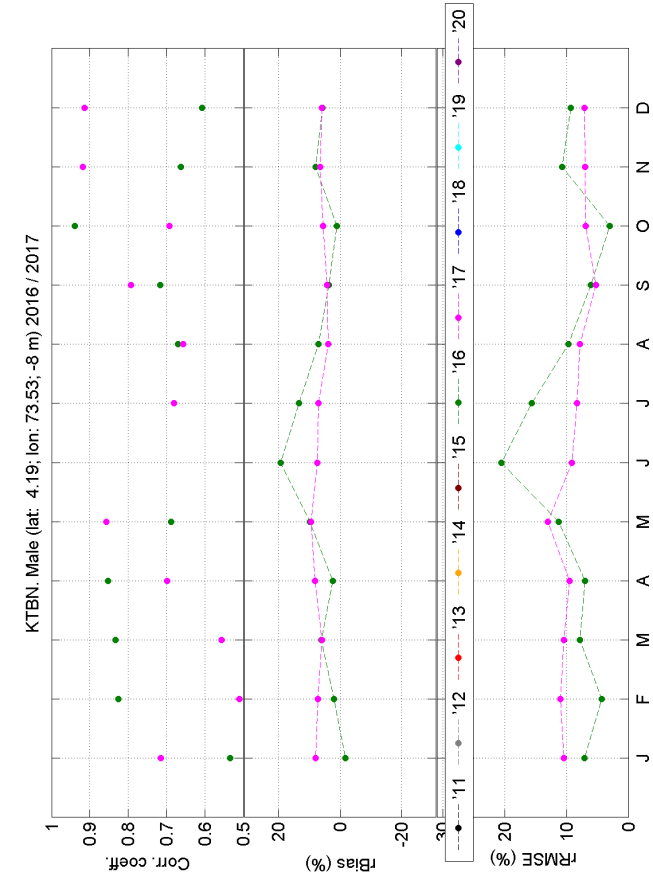


Figure S20: Comparison on direct clearness index at Male

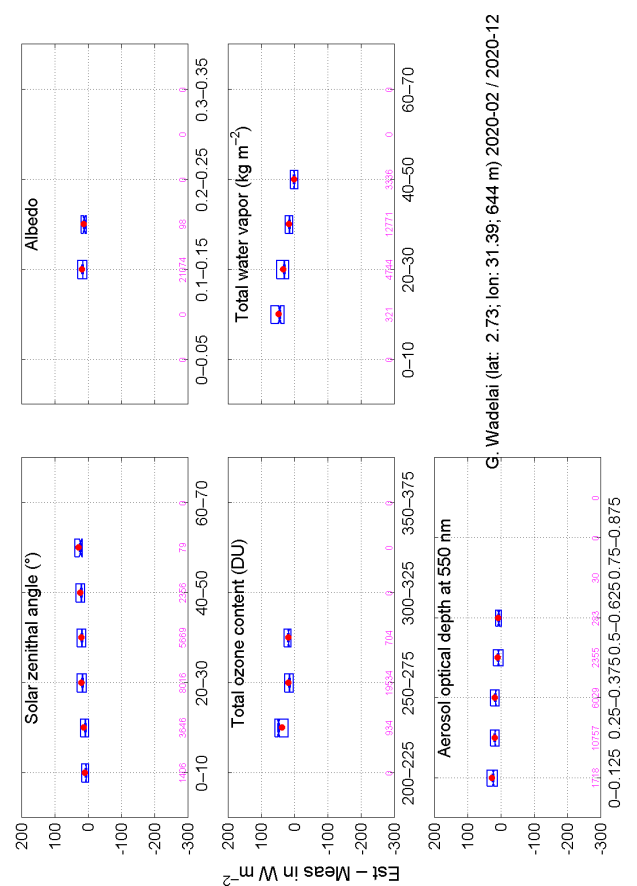
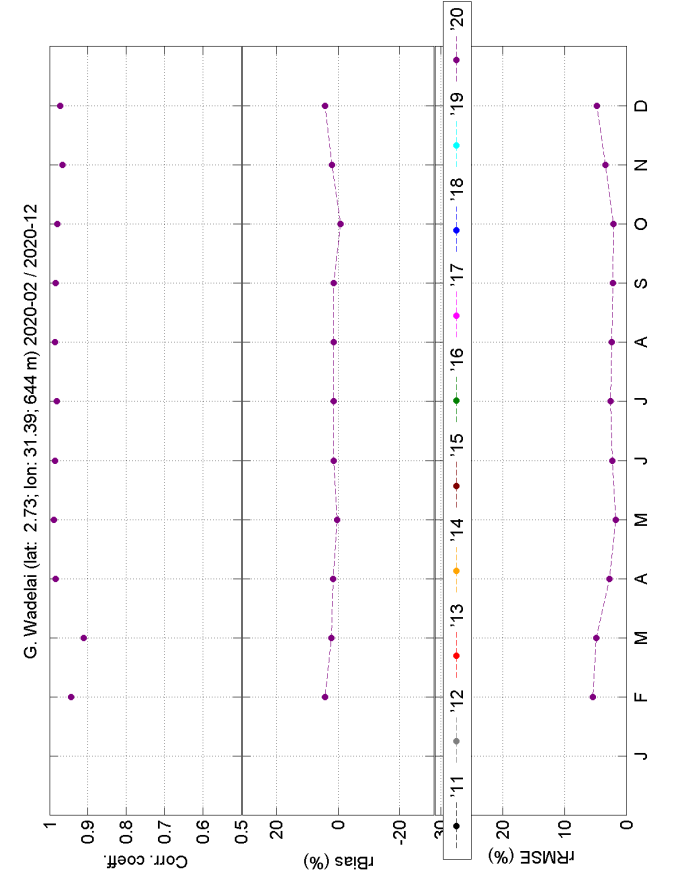


Figure S21: Comparison on global irradiance at Wadelai

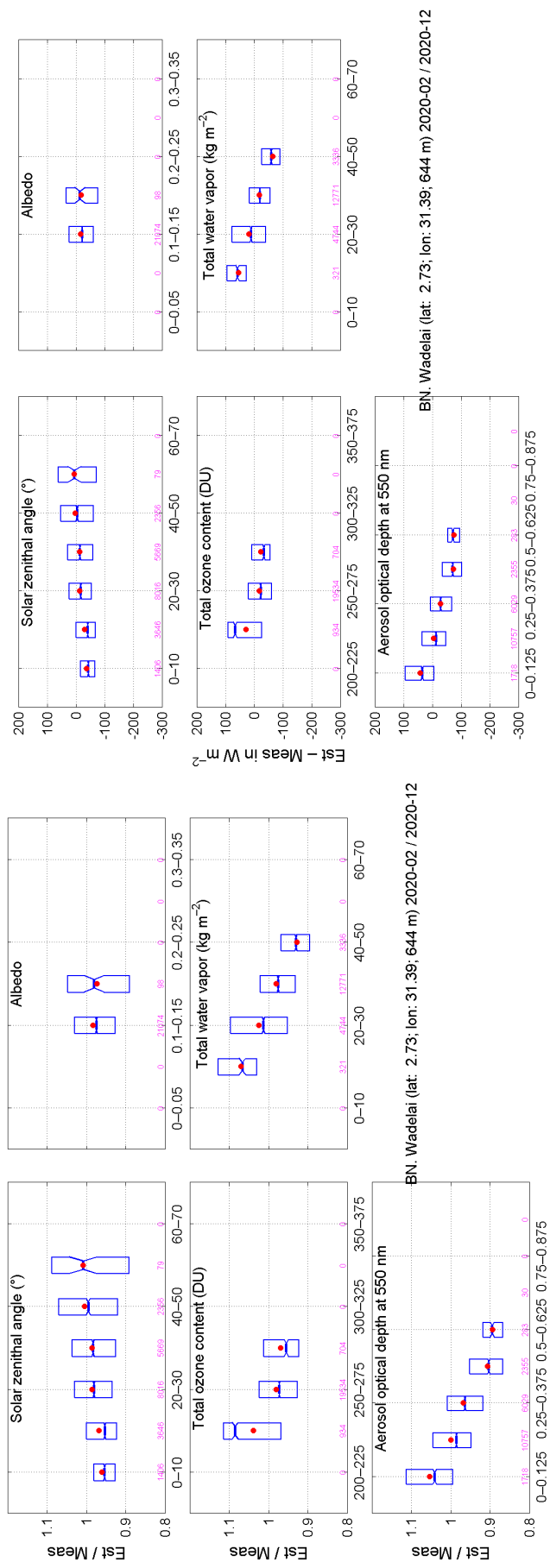
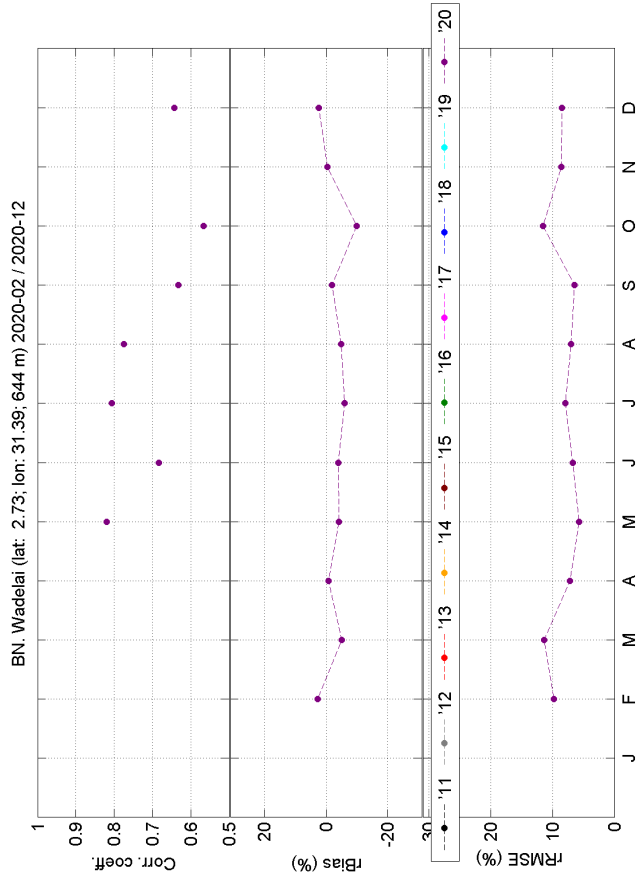
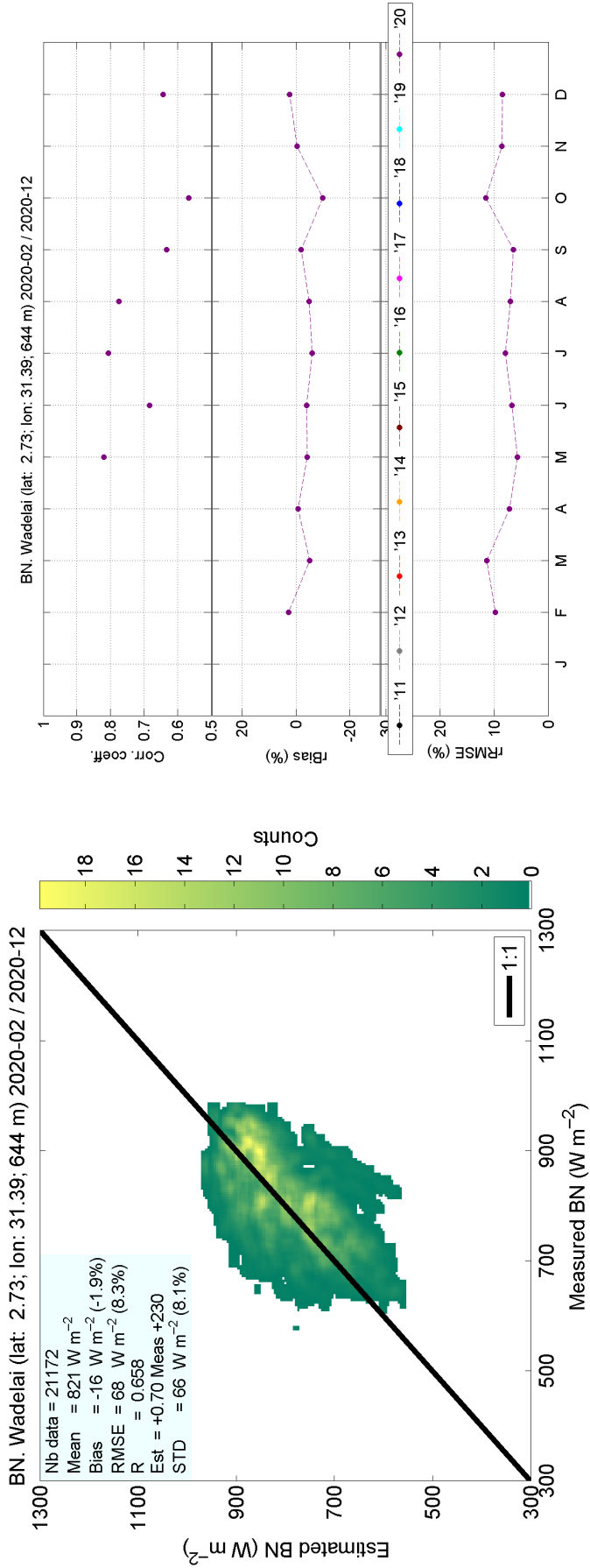


Figure S22: Comparison on direct component at normal irradiance at Wadelai

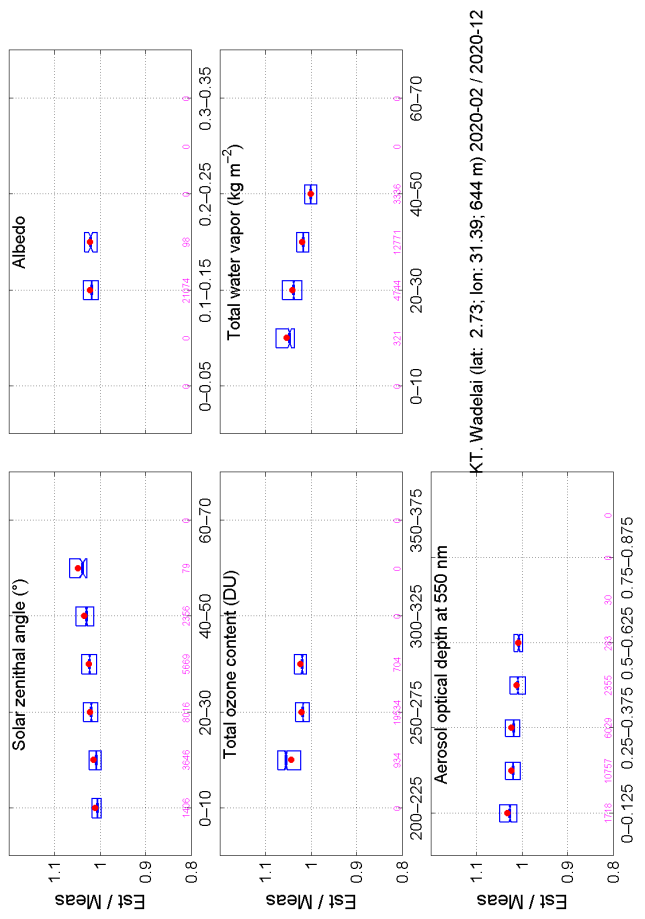
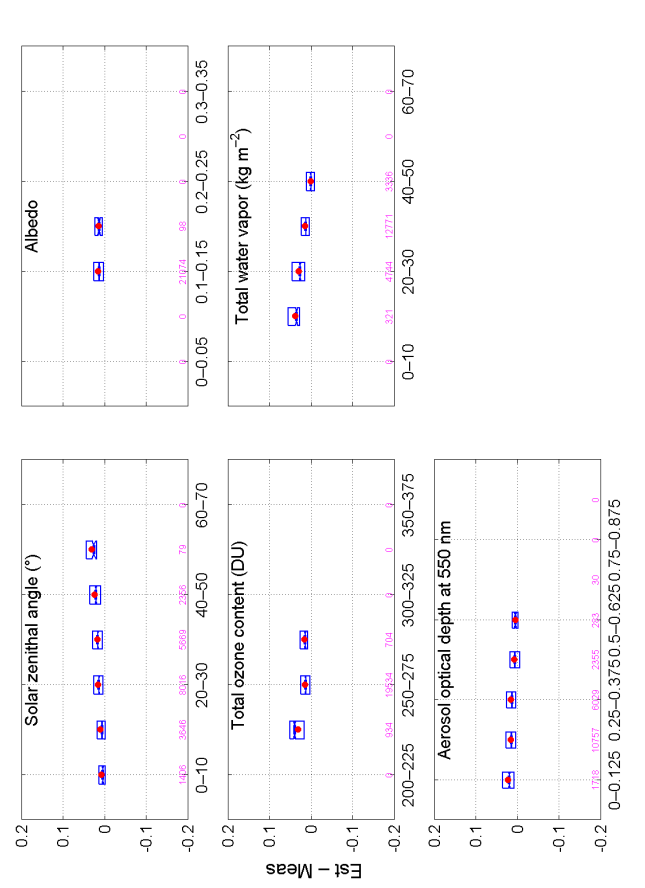
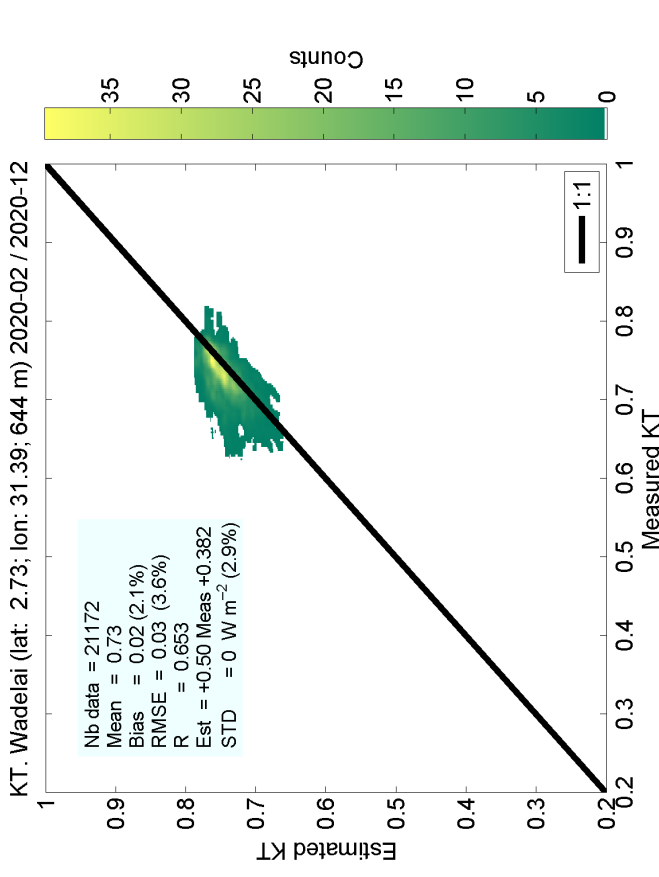
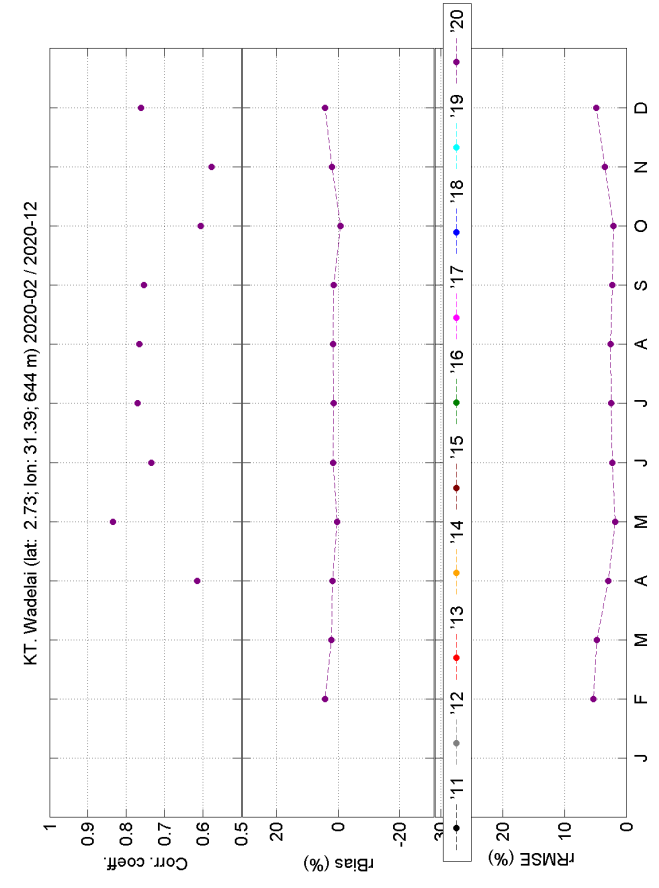
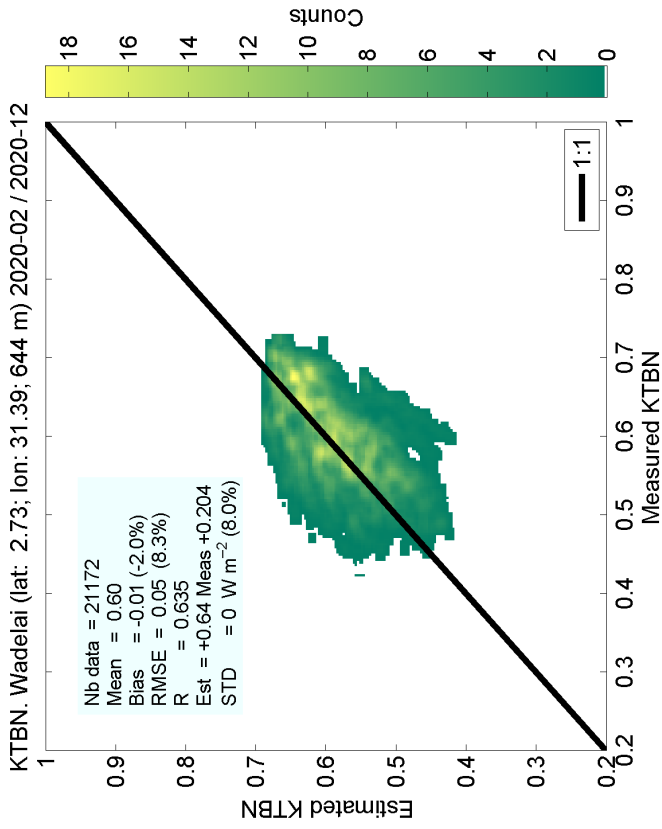


Figure S23: Comparison on clearness index at Wadelai



KTBN, Wadelai (lat: 2.73; lon: 31.39; 644 m) 2020-02 / 2020-12

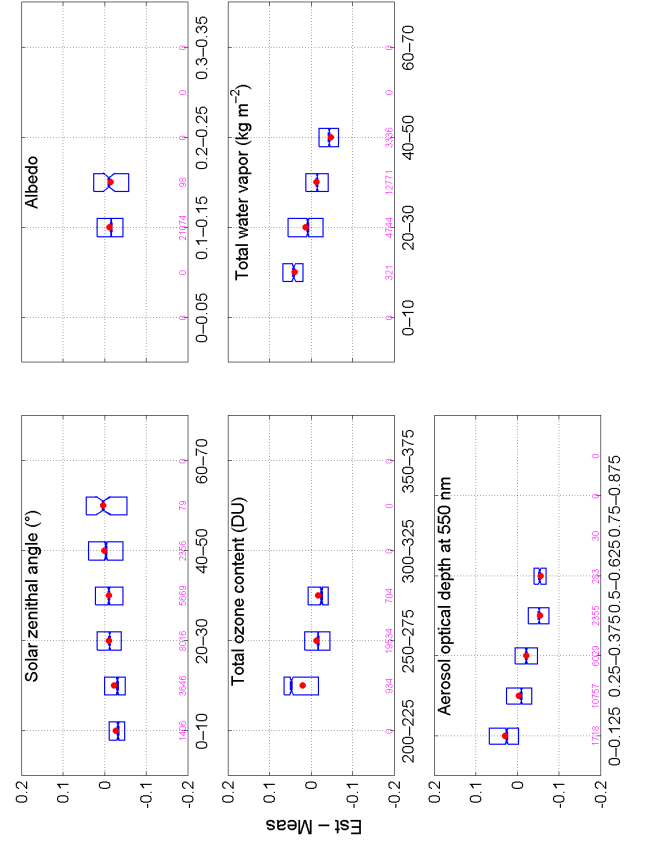
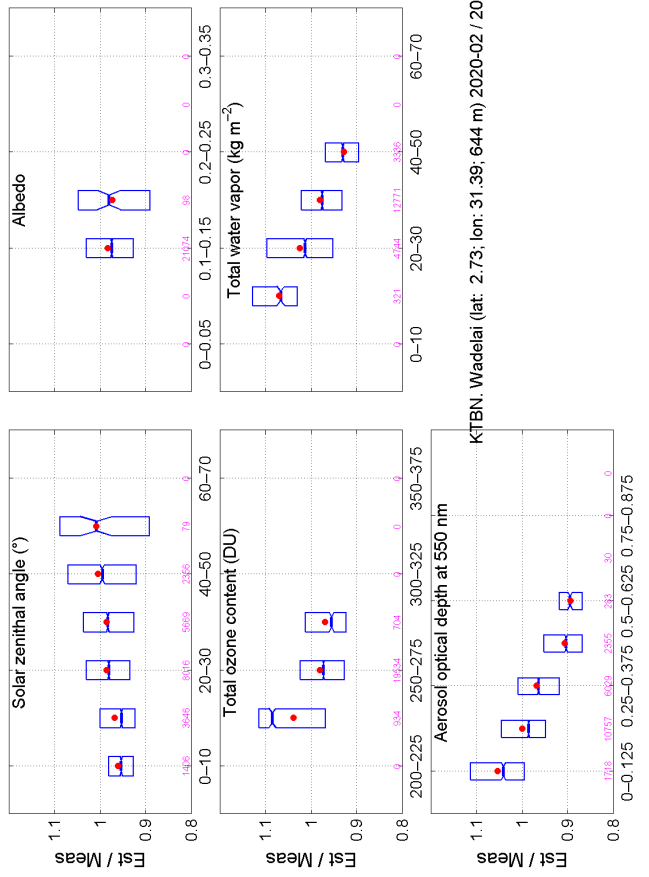
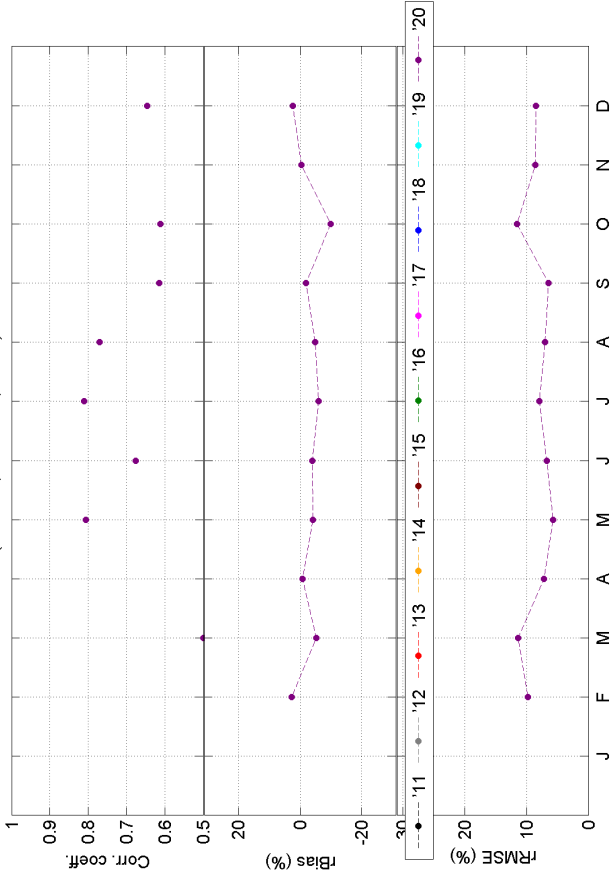
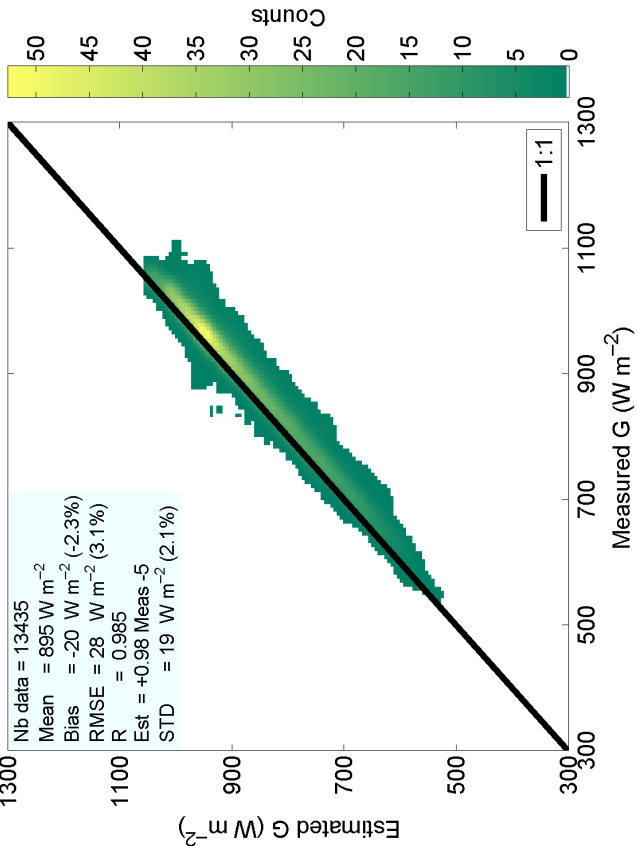
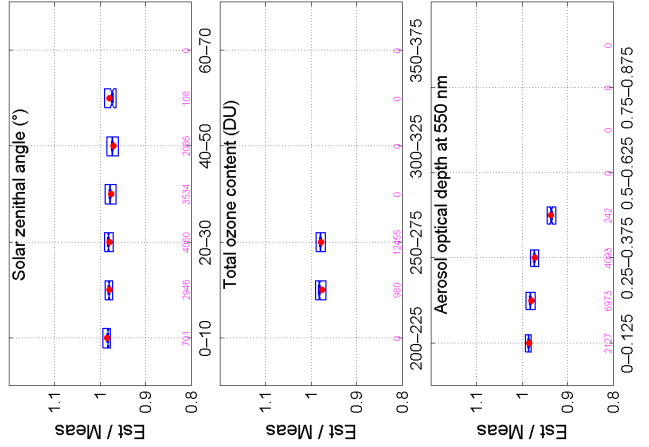
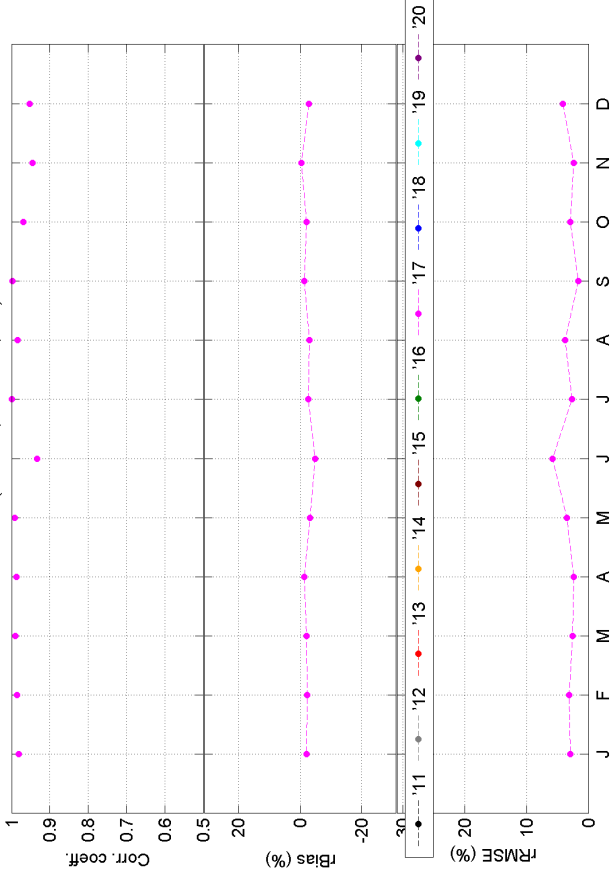


Figure S24: Comparison on direct clearness index at Wadelai

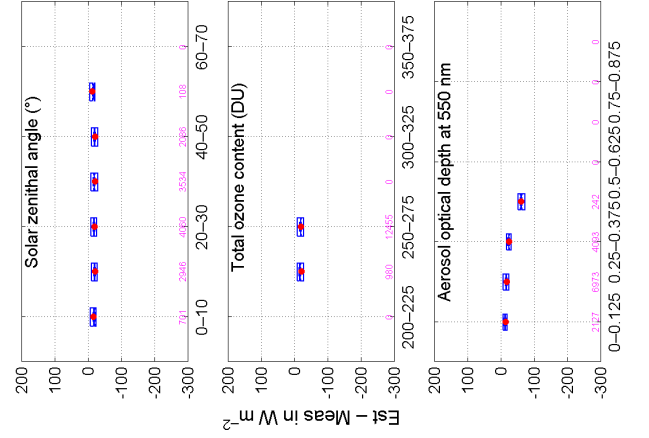
G. Kadhoo (lat: 1.86; lon: 73.52; 0 m) 2017



G. Kadhoo (lat: 1.86; lon: 73.52; 0 m) 2017



G. Kadhoo (lat: 1.86; lon: 73.52; 0 m) 2017



G. Kadhoo (lat: 1.86; lon: 73.52; 0 m) 2017

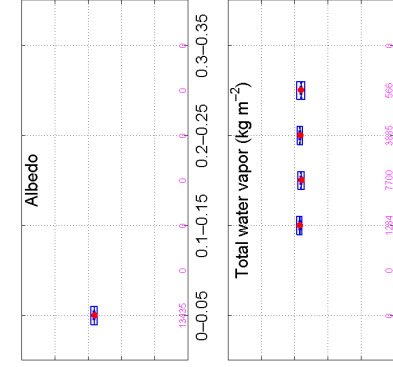


Figure S25: Comparison on global irradiance at Kadhoo

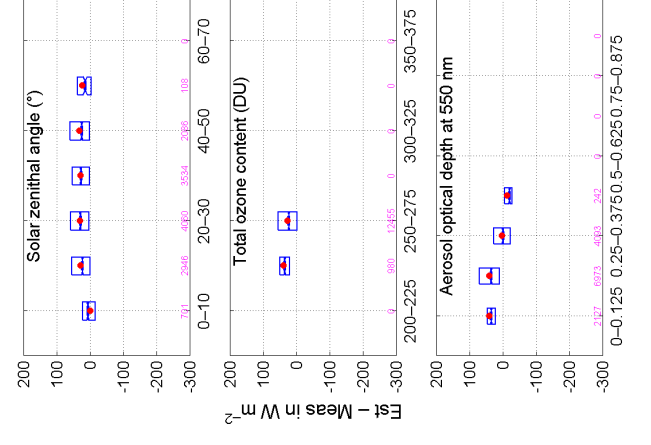
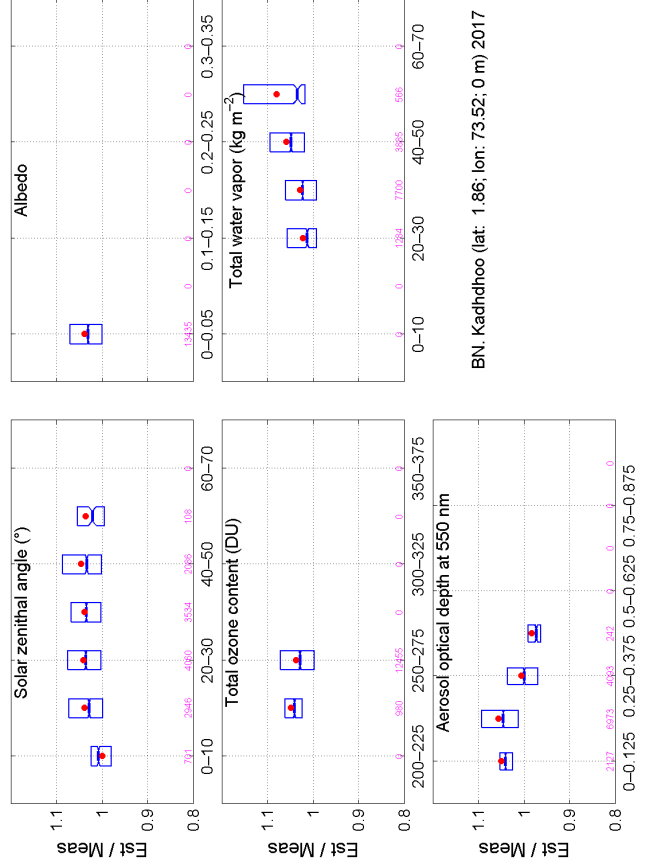
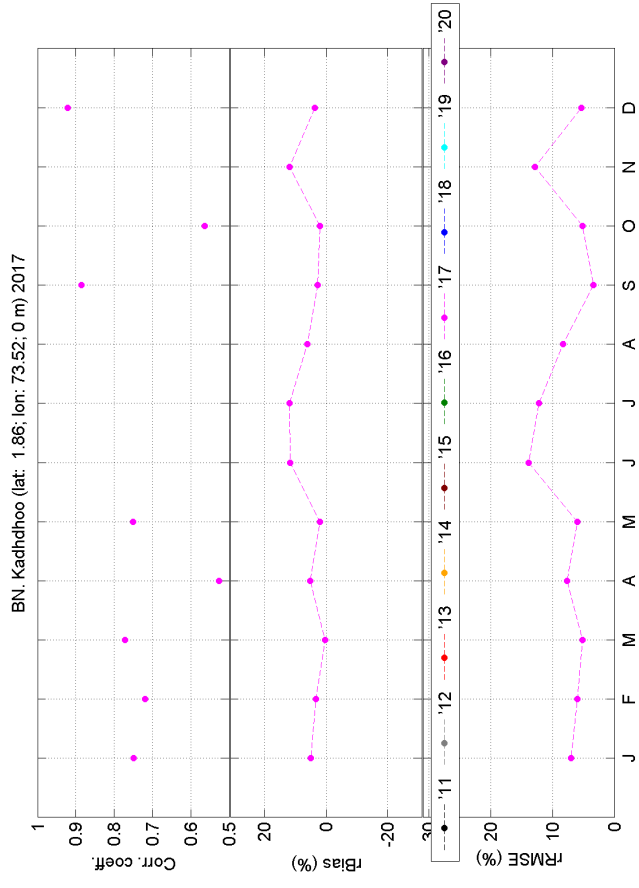
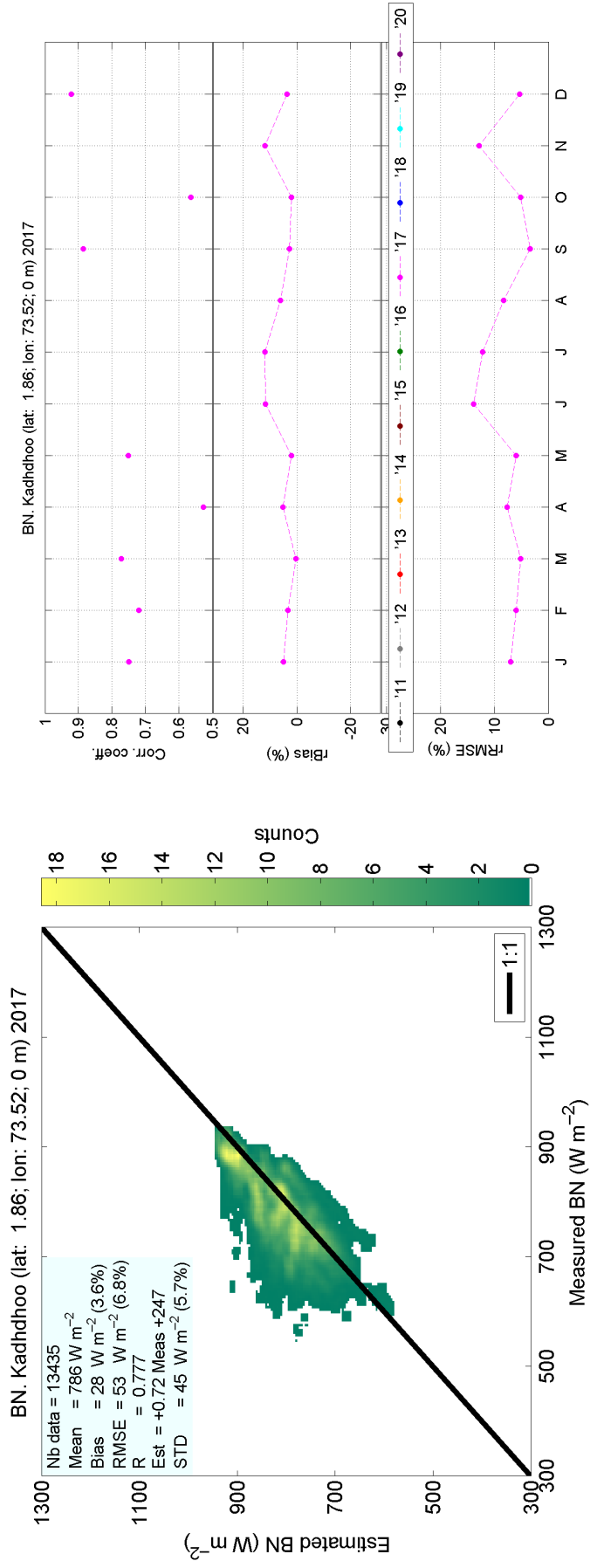


Figure S26: Comparison on direct component at normal irradiance at Kadhoo

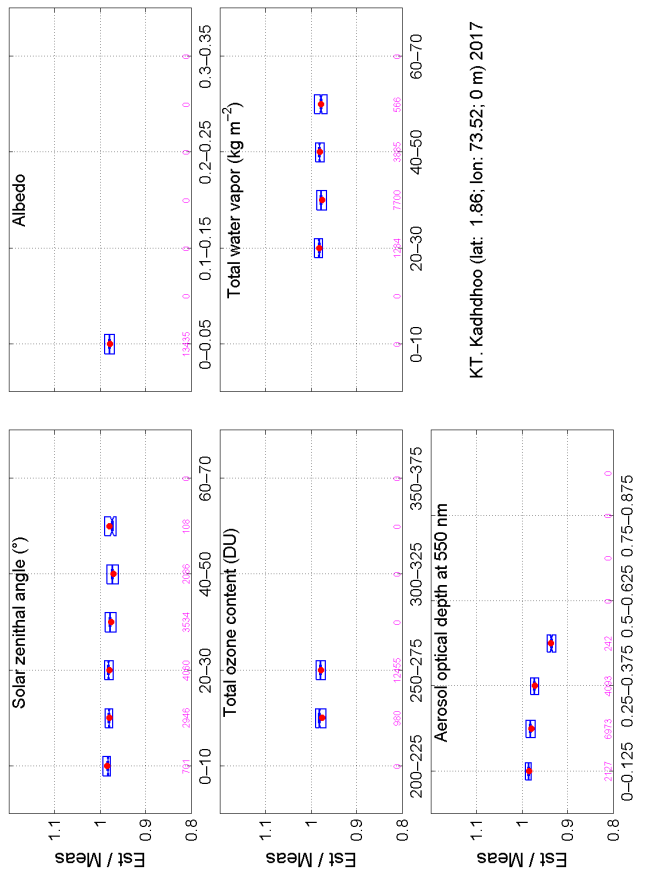
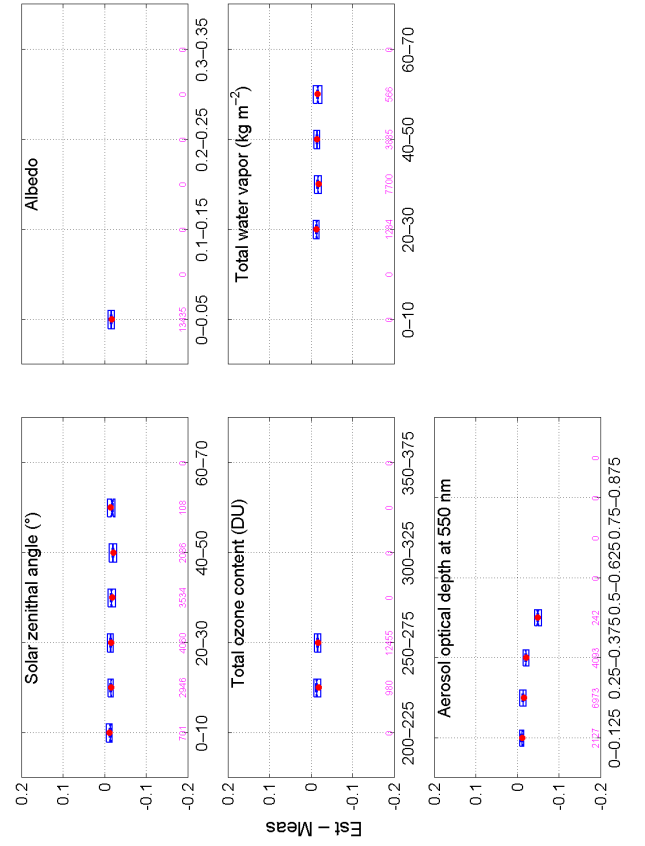
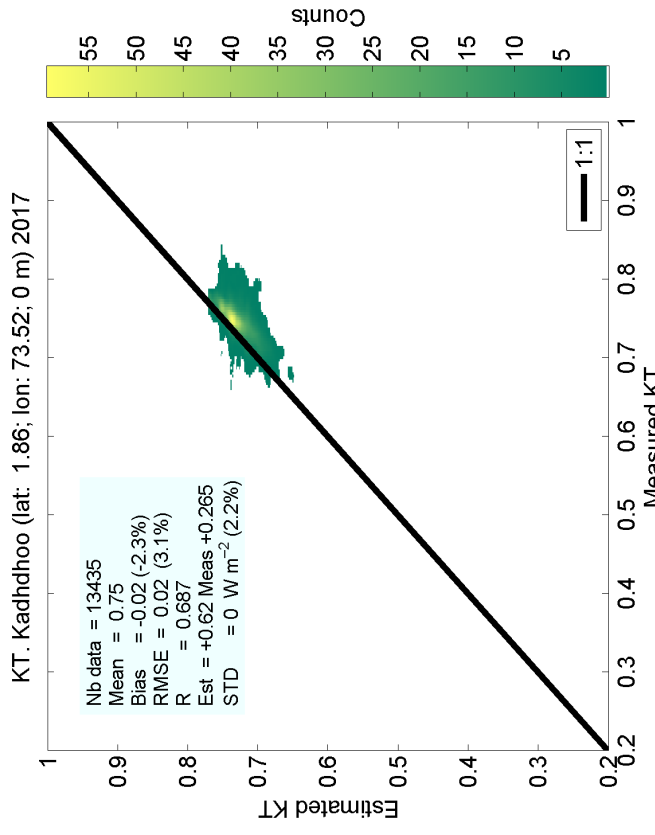
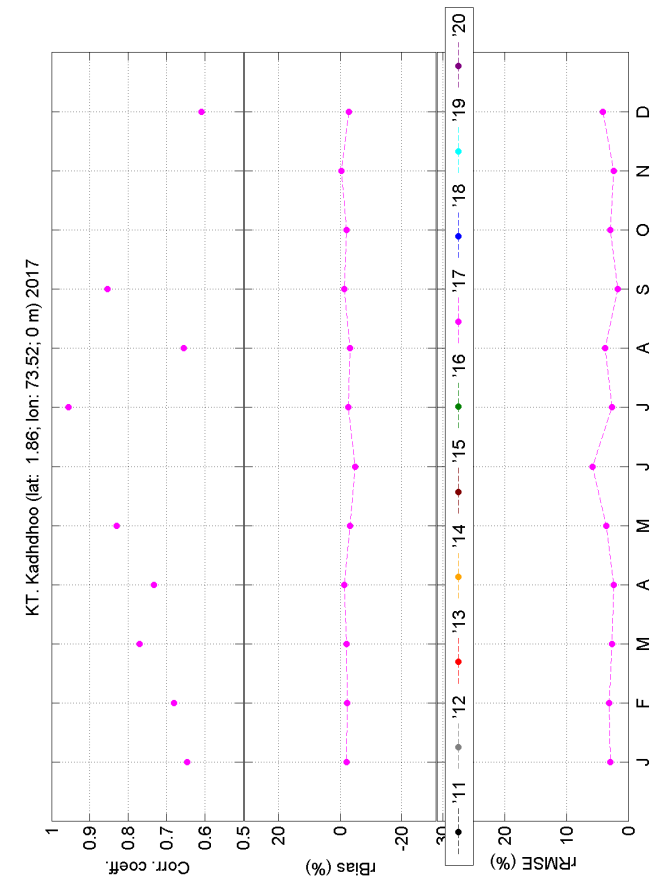
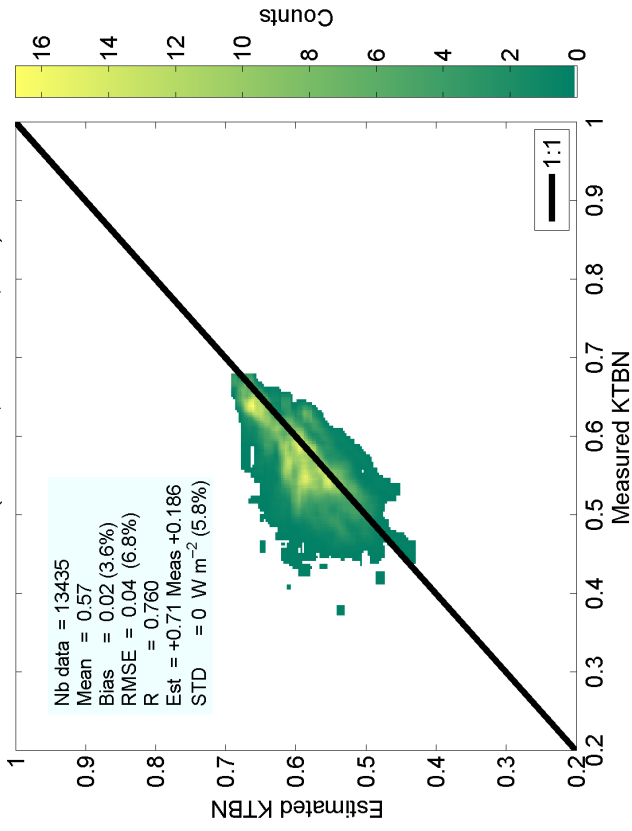
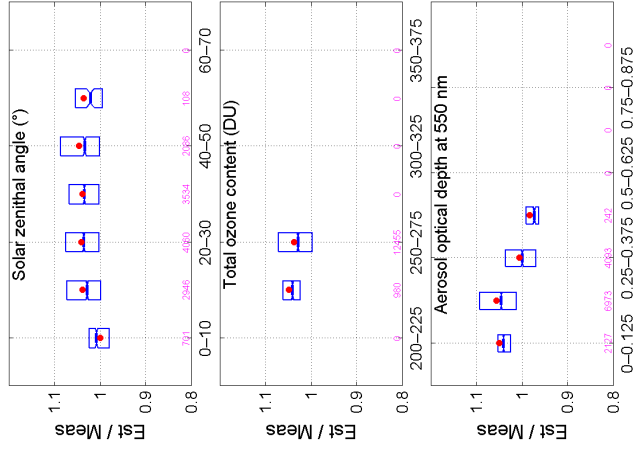
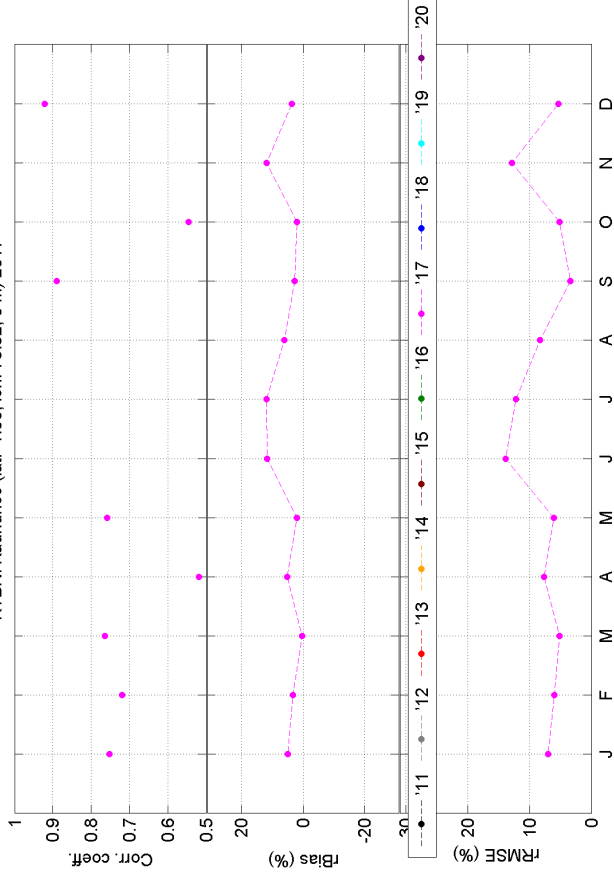


Figure S27: Comparison on clearness index at Kadhoo

KTBN, Kadhoo (lat: 1.86; lon: 73.52; 0 m) 2017



KTBN, Kadhoo (lat: 1.86; lon: 73.52; 0 m) 2017



KTBN, Kadhoo (lat: 1.86; lon: 73.52; 0 m) 2017

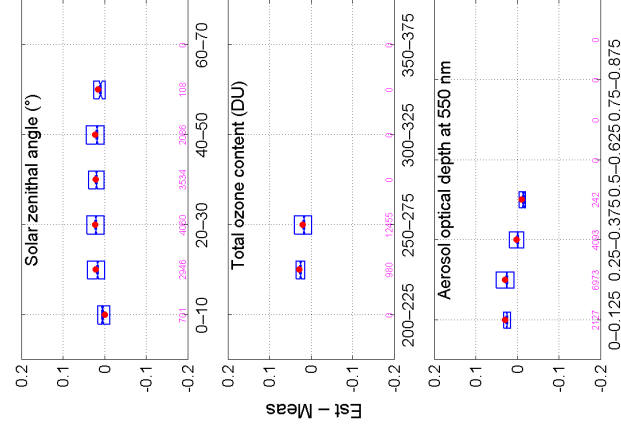


Figure S28: Comparison on direct clearness index at Kadhoo

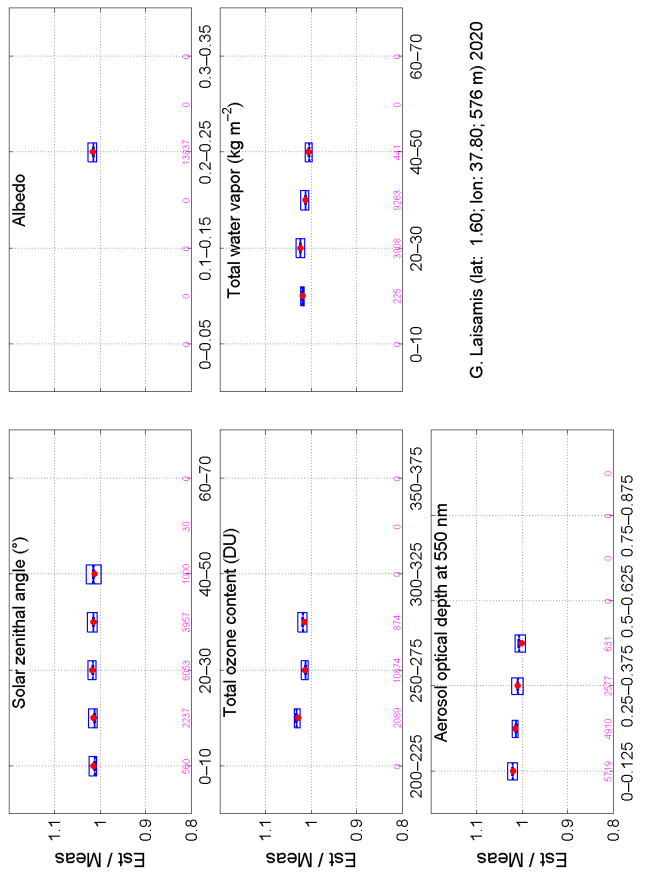
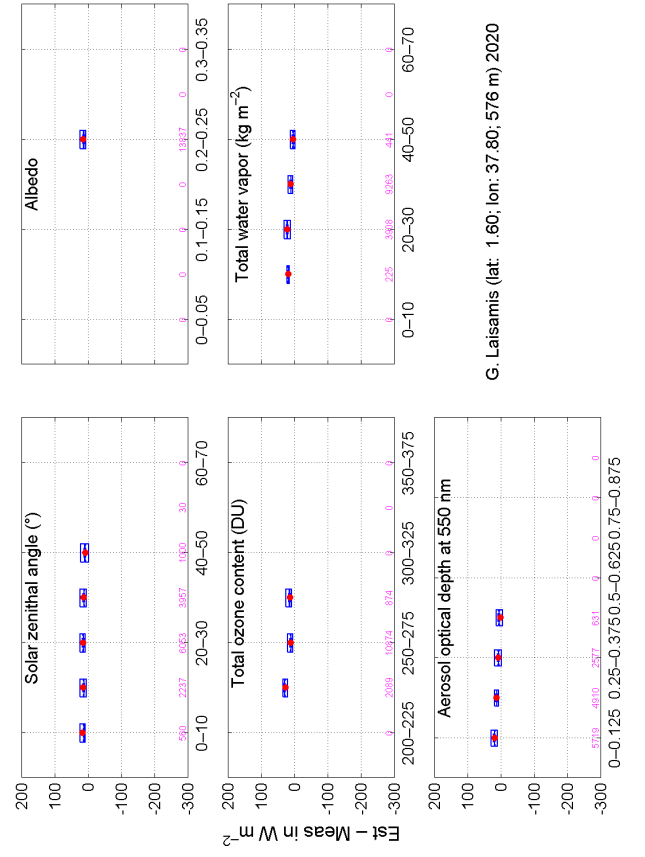
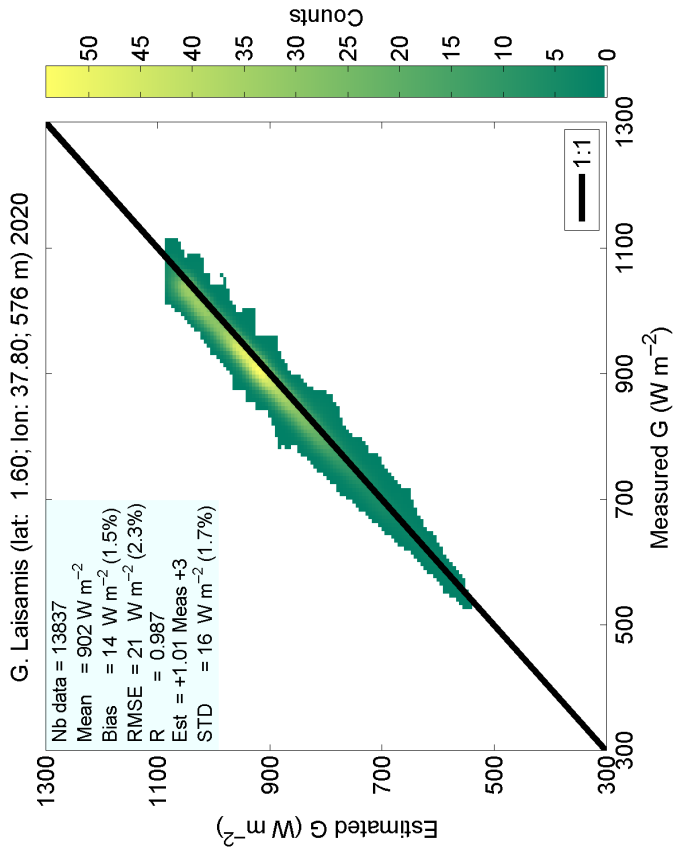
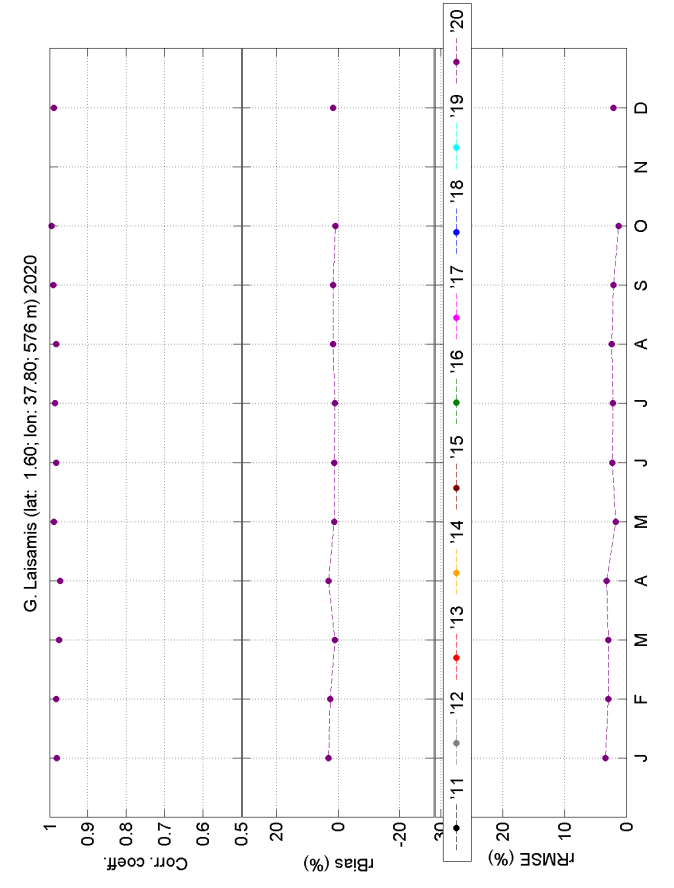


Figure S29: Comparison on global irradiance at Laisamis

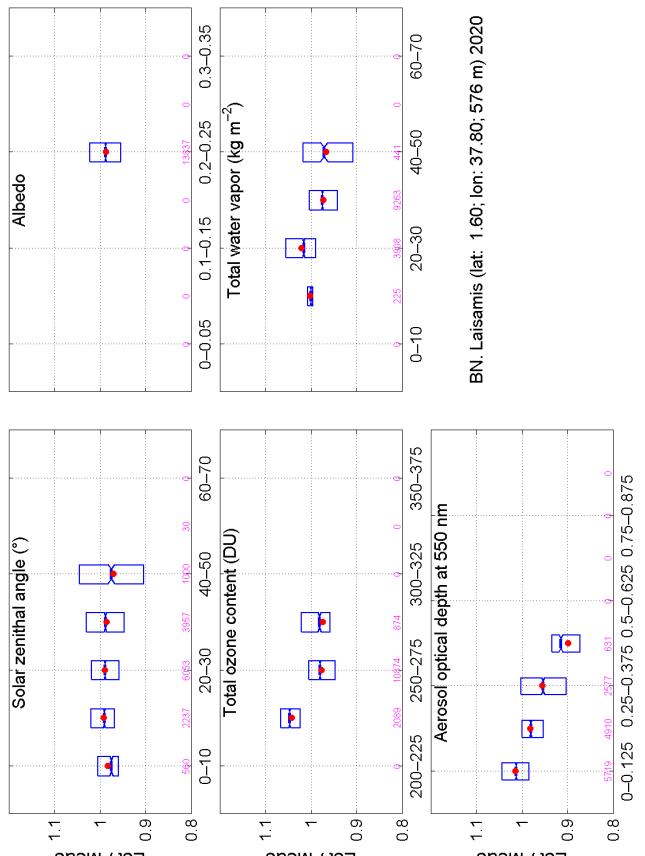
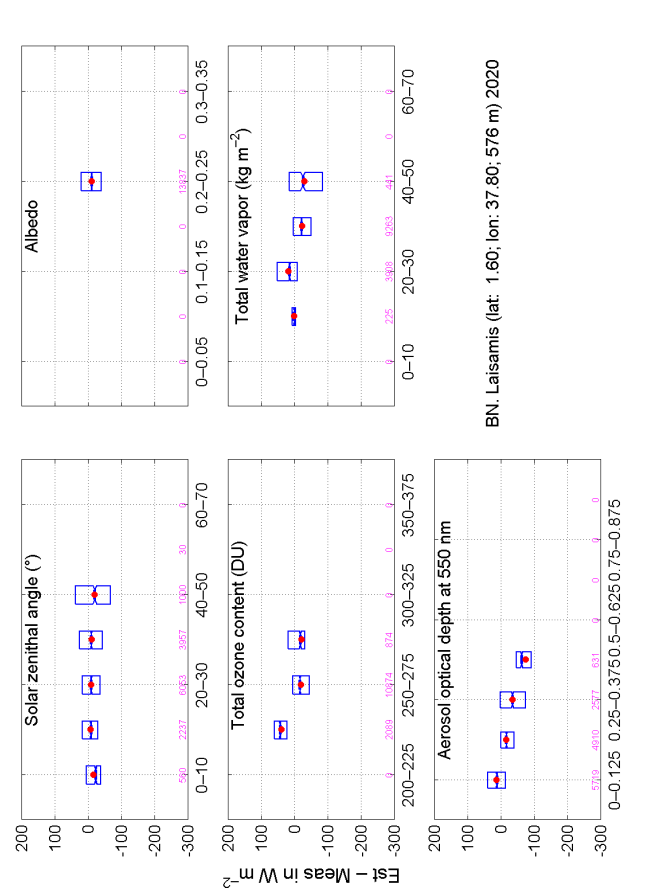
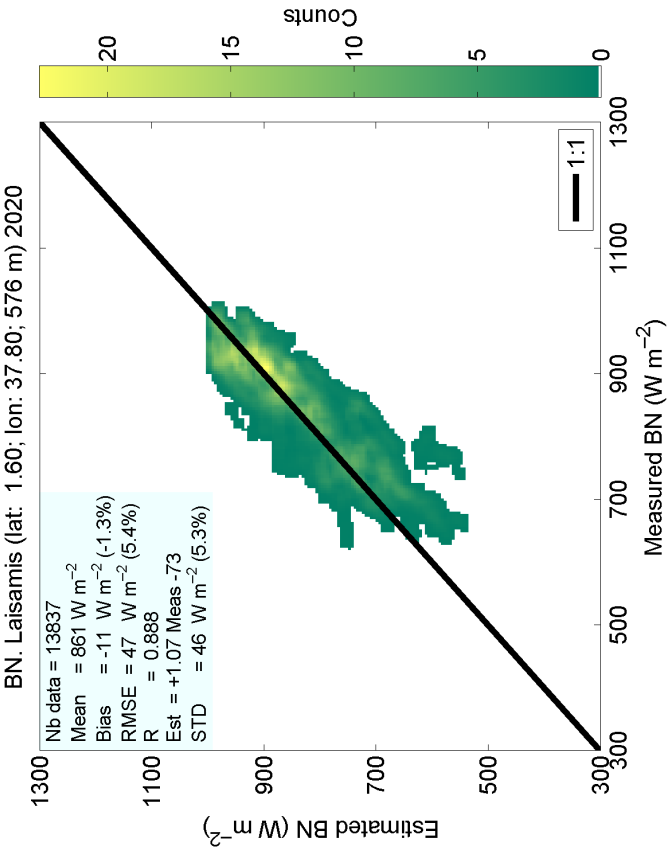
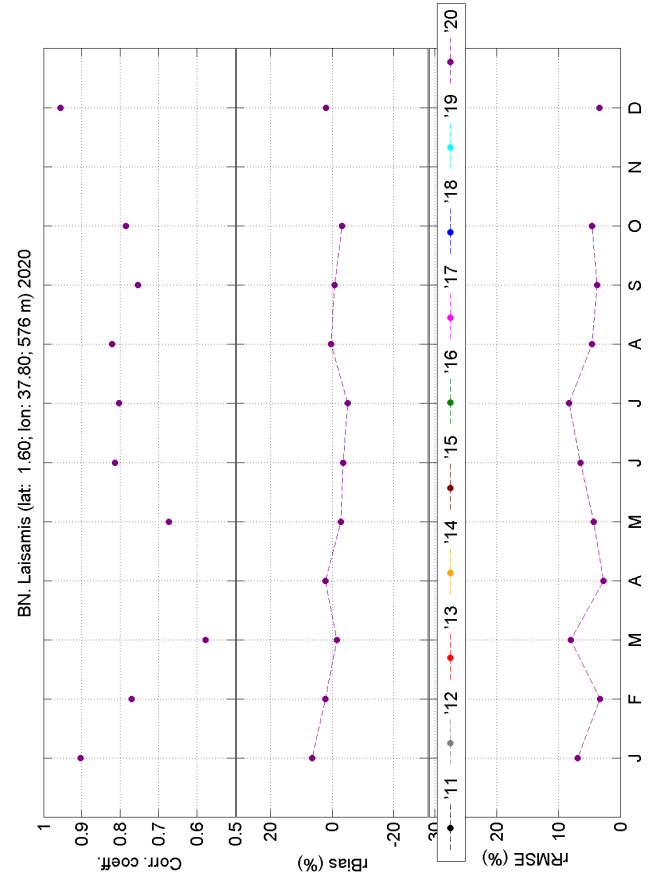


Figure S30: Comparison on direct component at normal irradiance at Laisamis

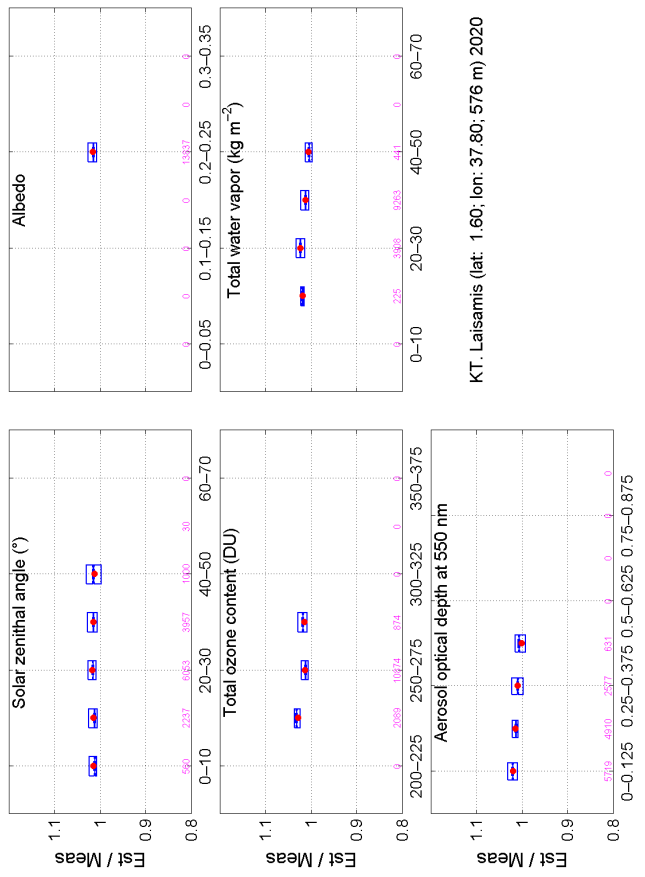
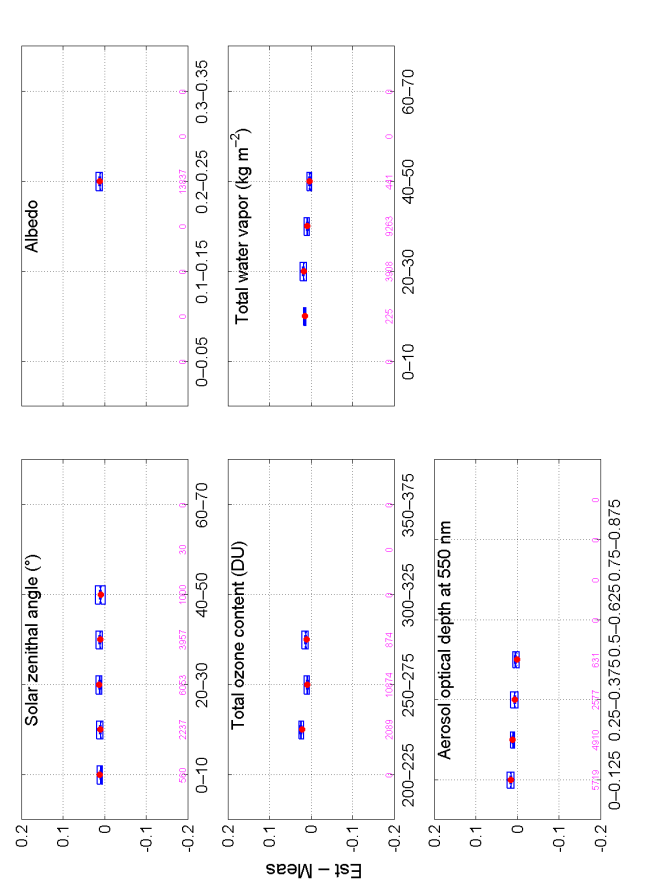
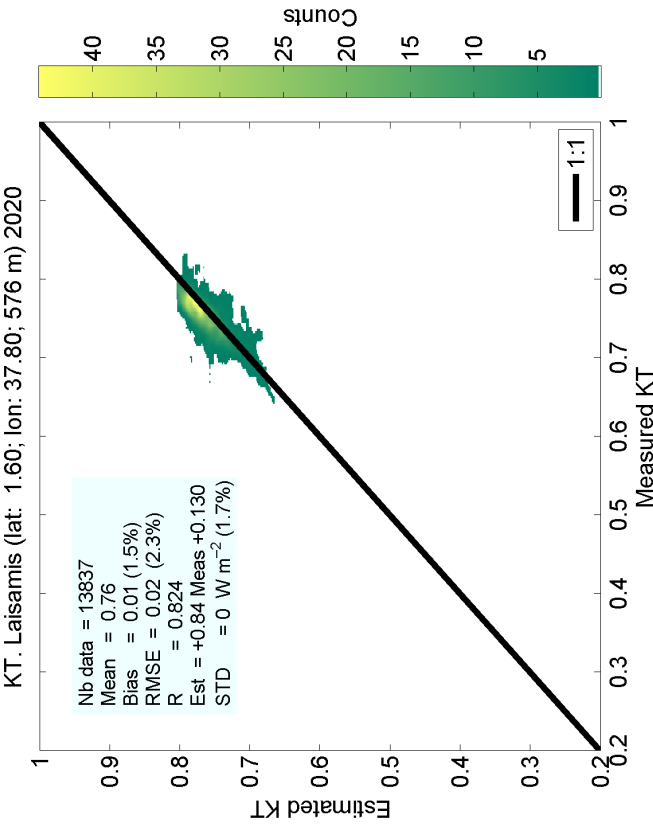
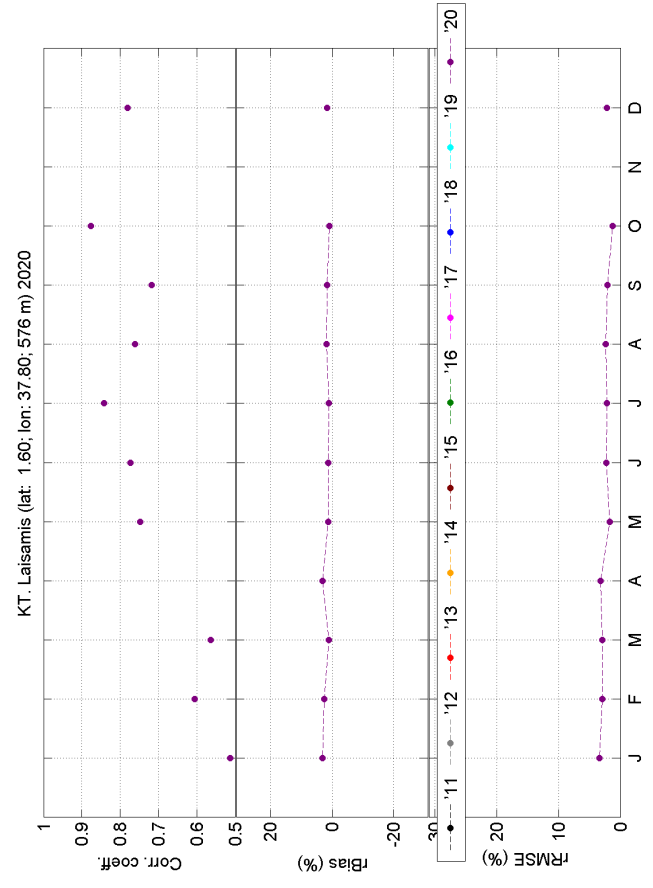
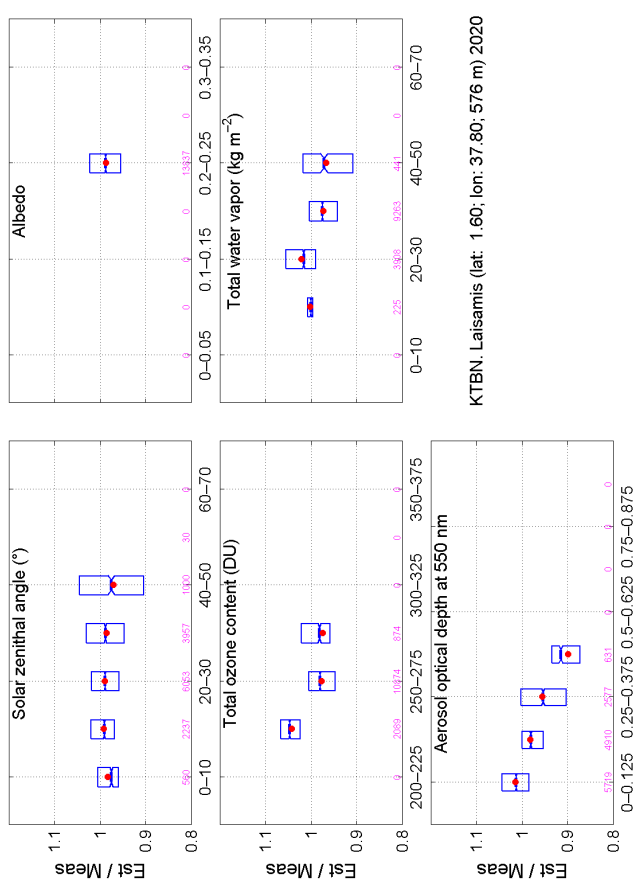
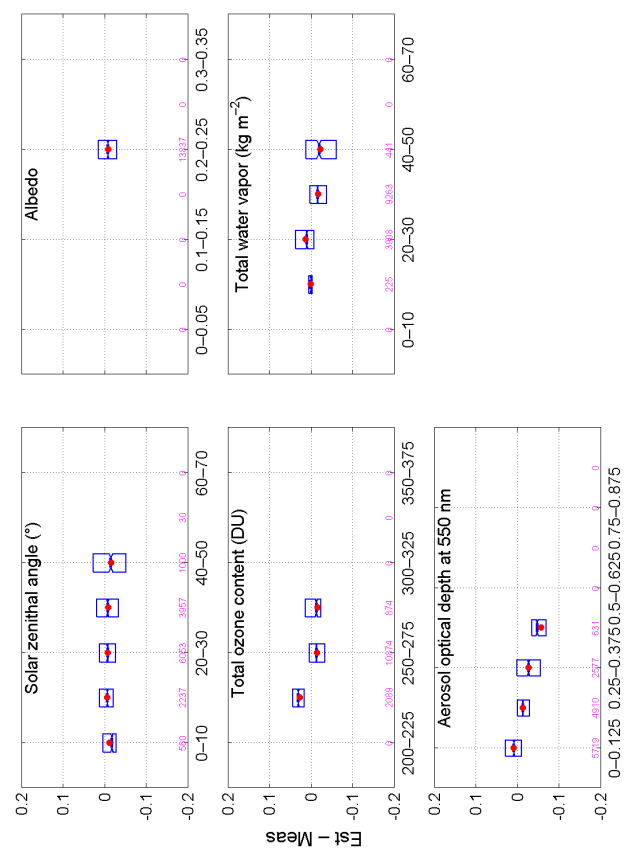
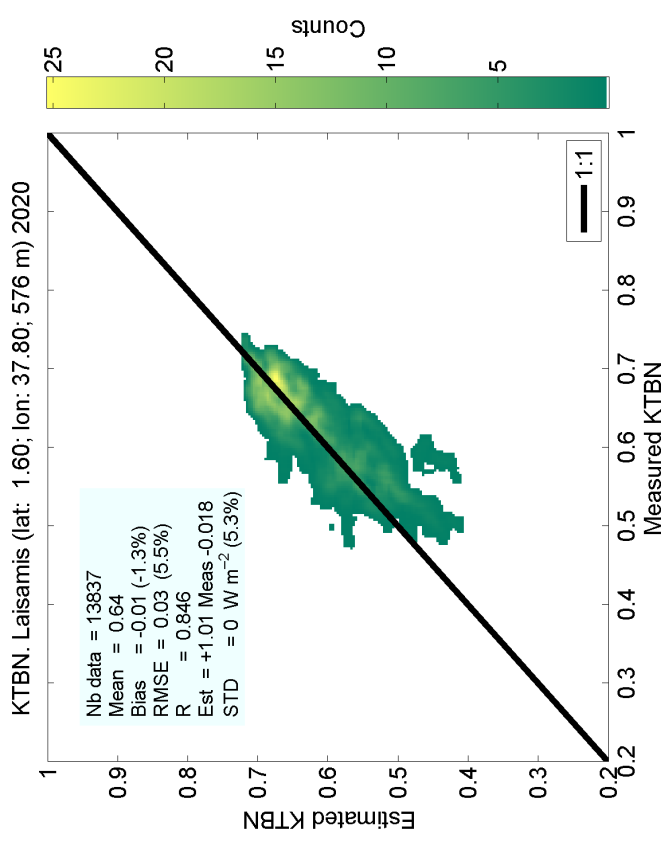
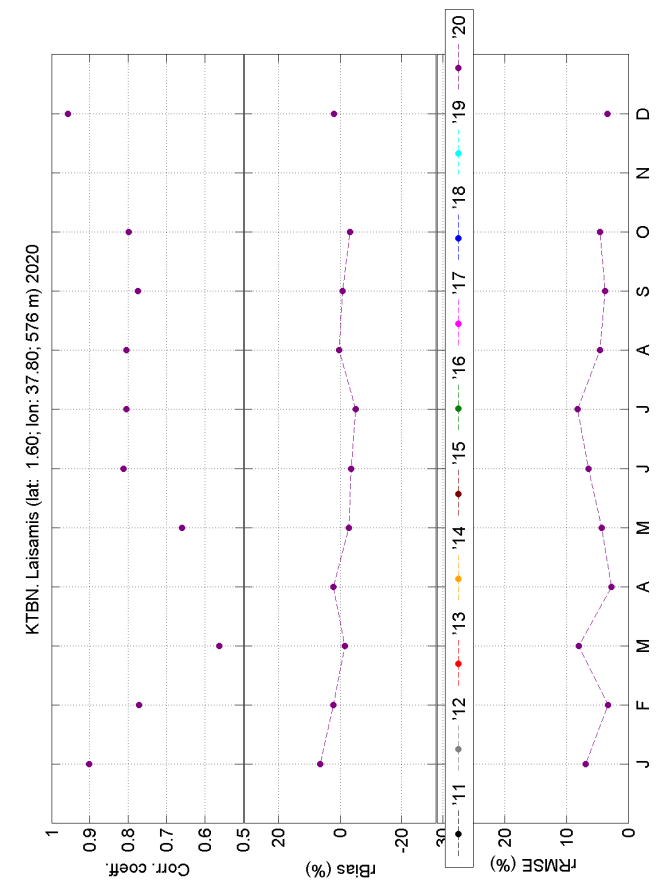
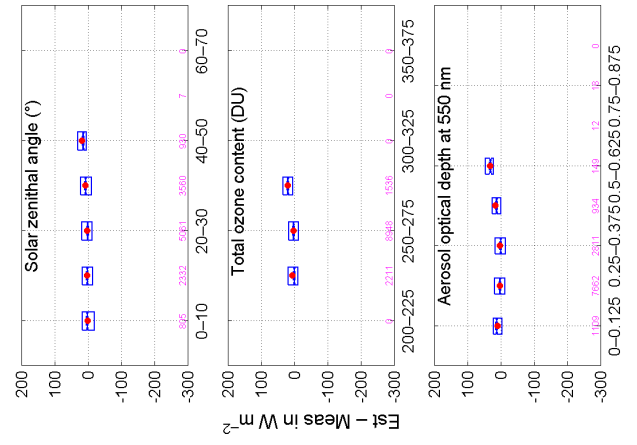
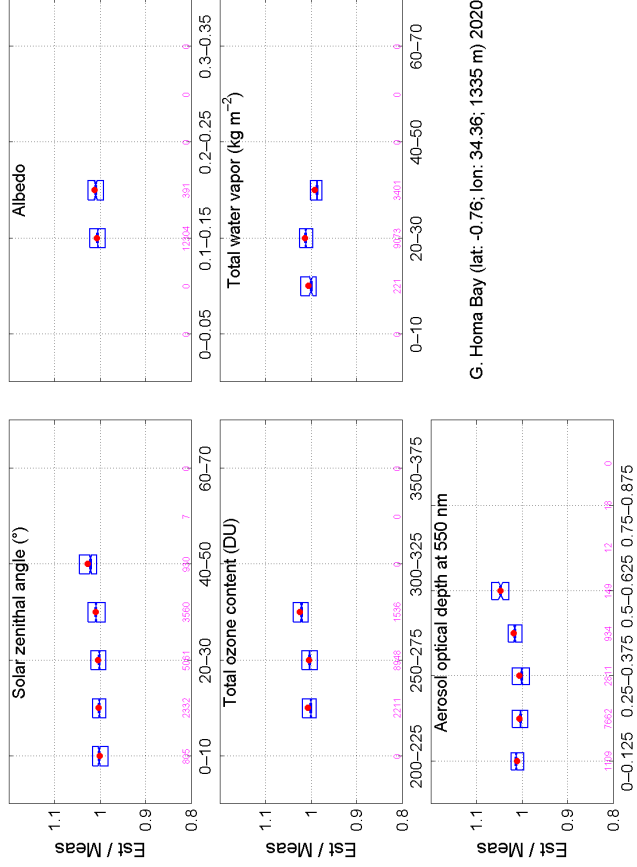
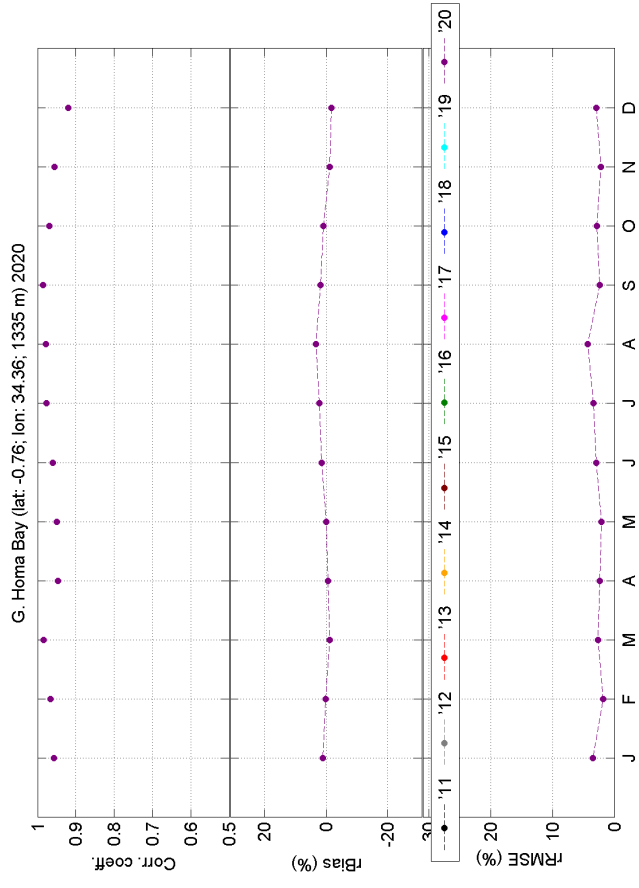
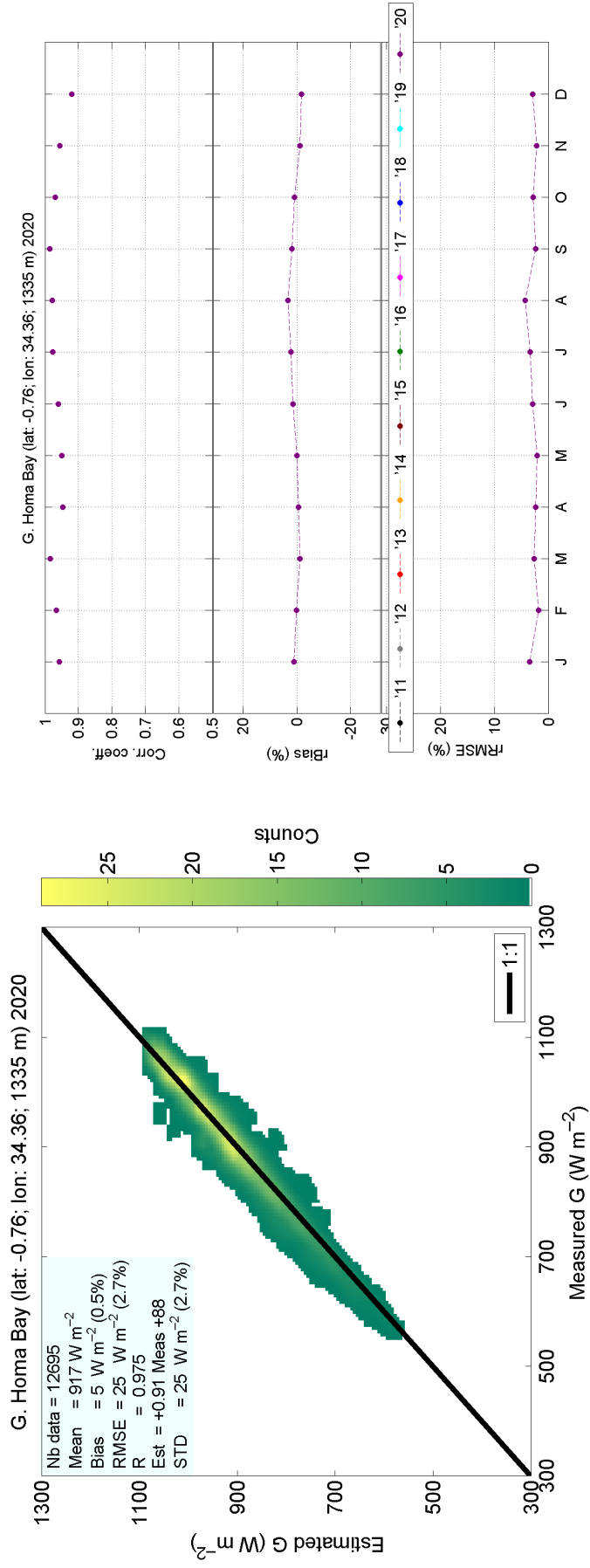


Figure S31: Comparison on clearness index at Laisamis



KTBN, Laisamis (lat: 1.60; lon: 37.80; 576 m) 2020

Figure S32: Comparison on direct clearness index at Laisamis



G. Homa Bay (lat: -0.76; lon: 34.36; 1335 m) 2020

G. Homa Bay (lat: -0.76; lon: 34.36; 1335 m) 2020

Figure S33: Comparison on global irradiance at Homa Bay

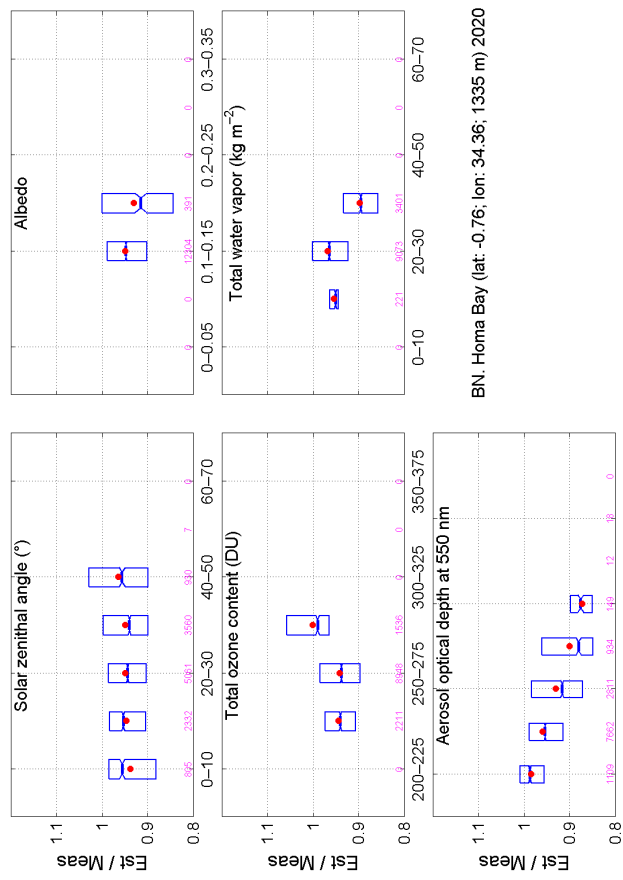
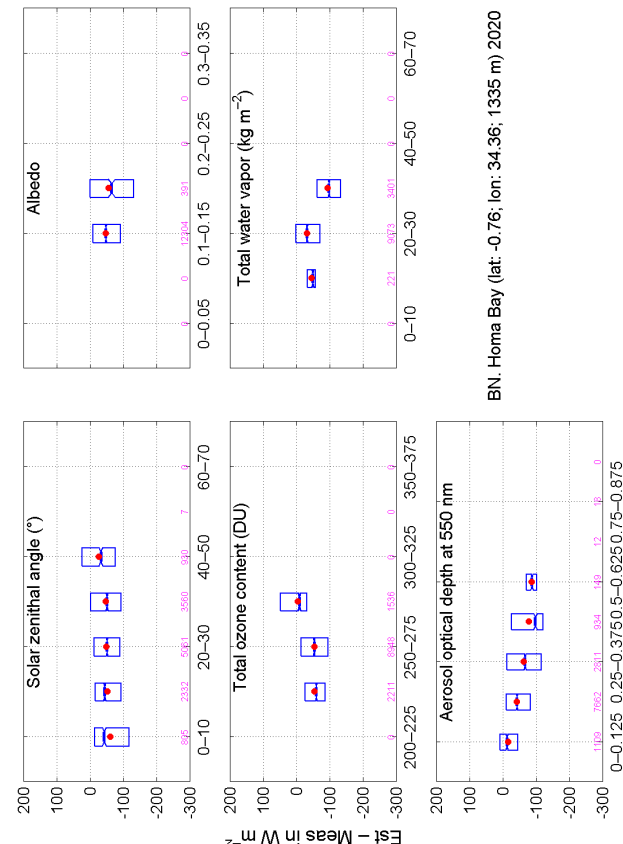
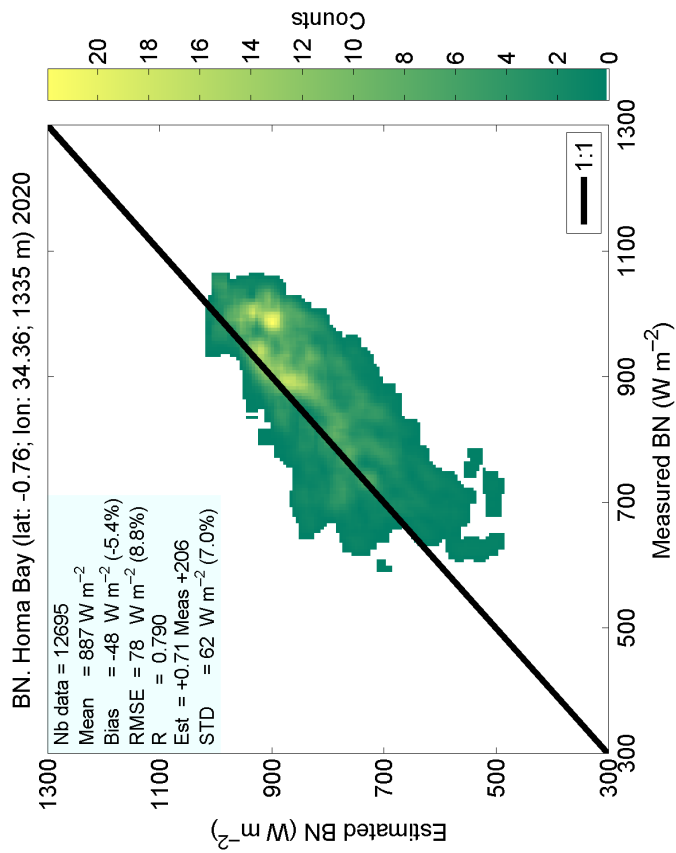
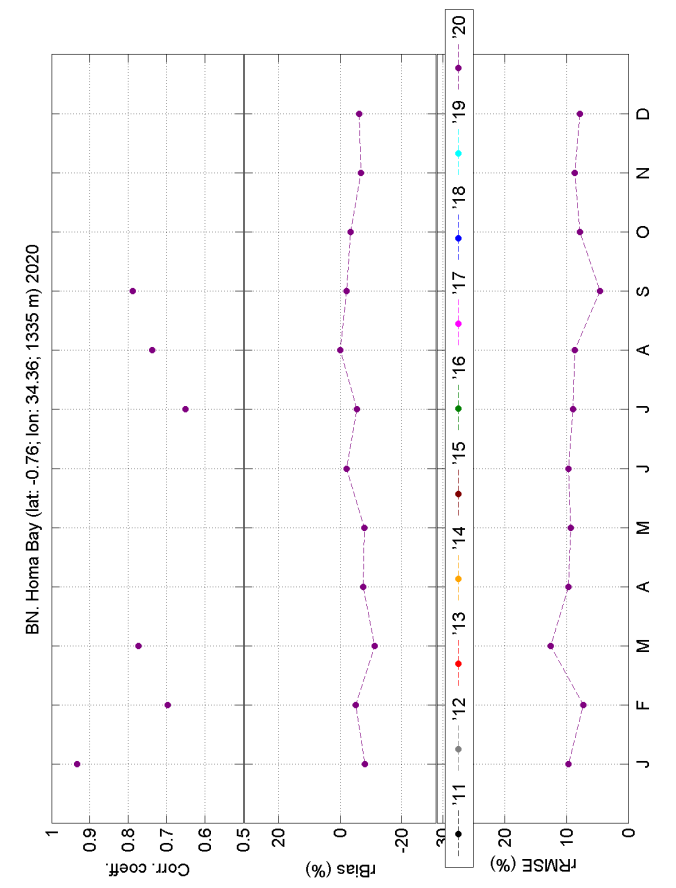


Figure S34: Comparison on direct component at normal irradiance at Homa Bay

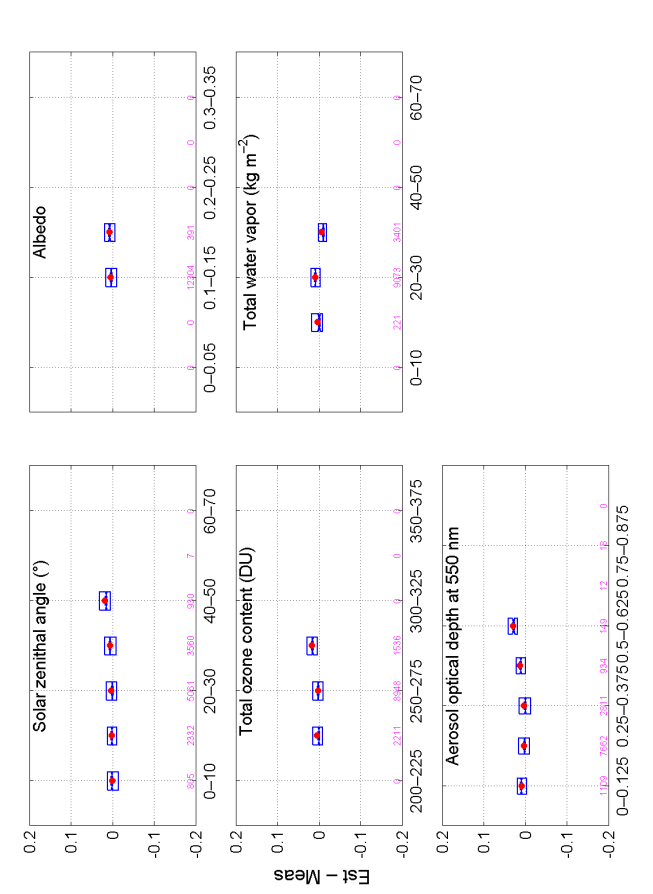
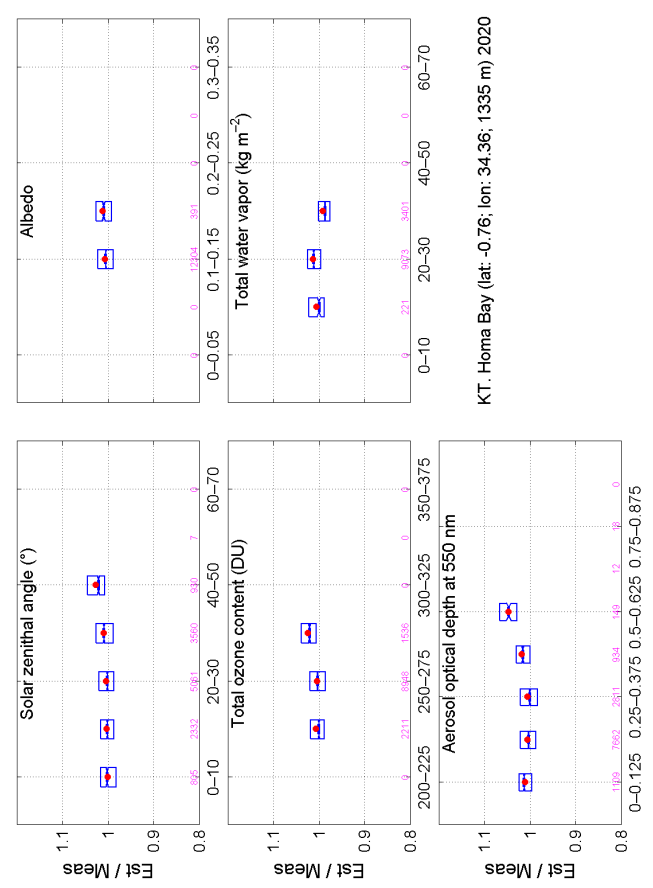
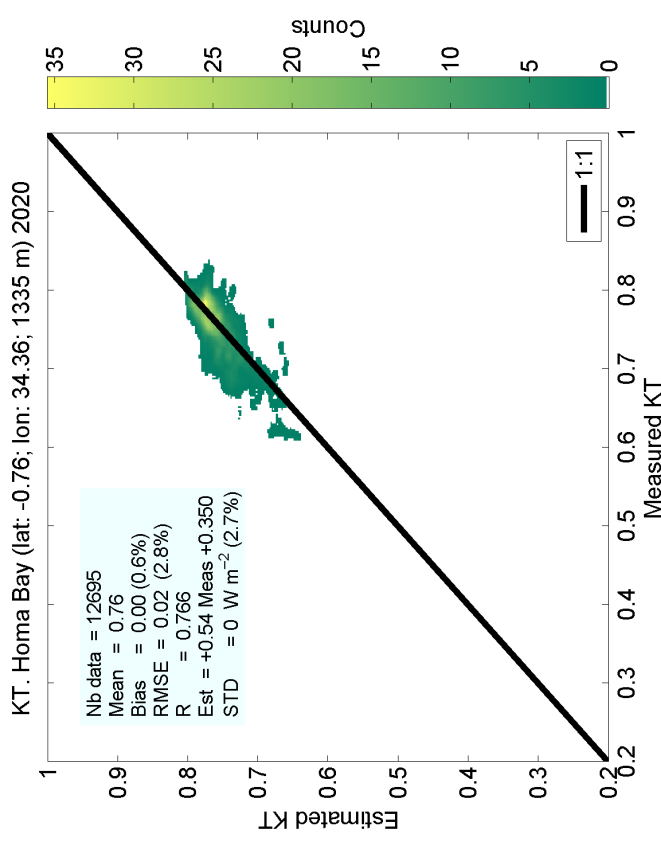
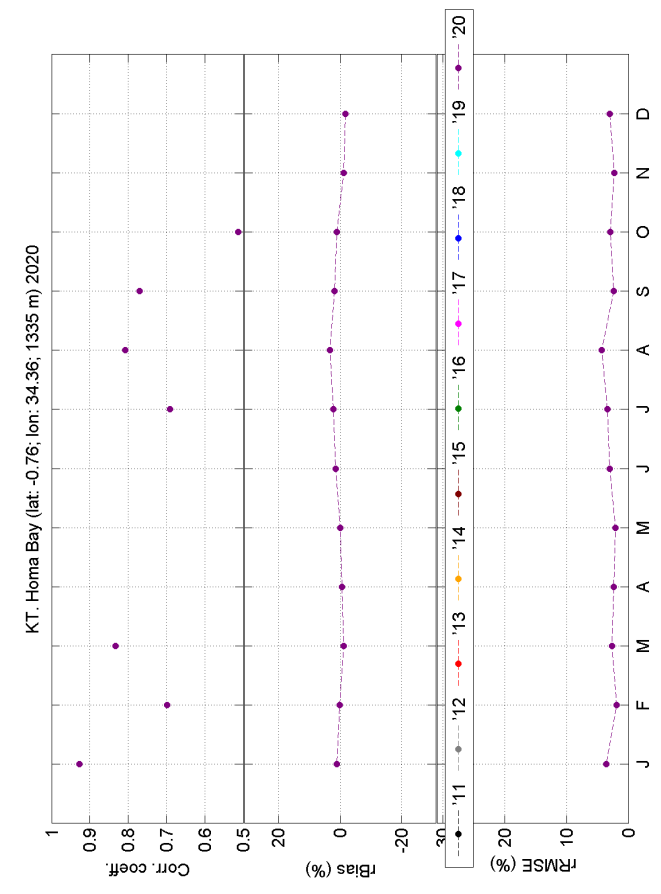


Figure S35: Comparison on clearness index at Homa Bay

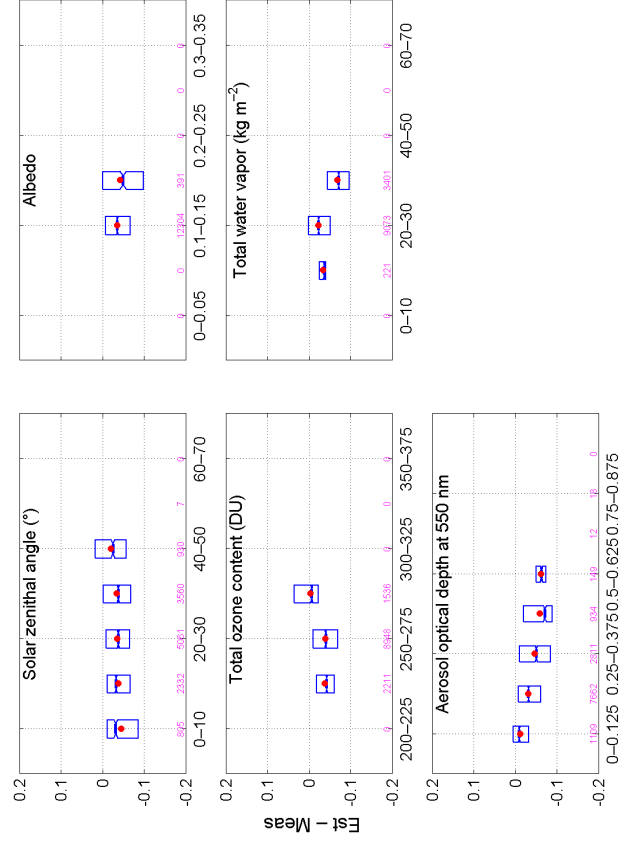
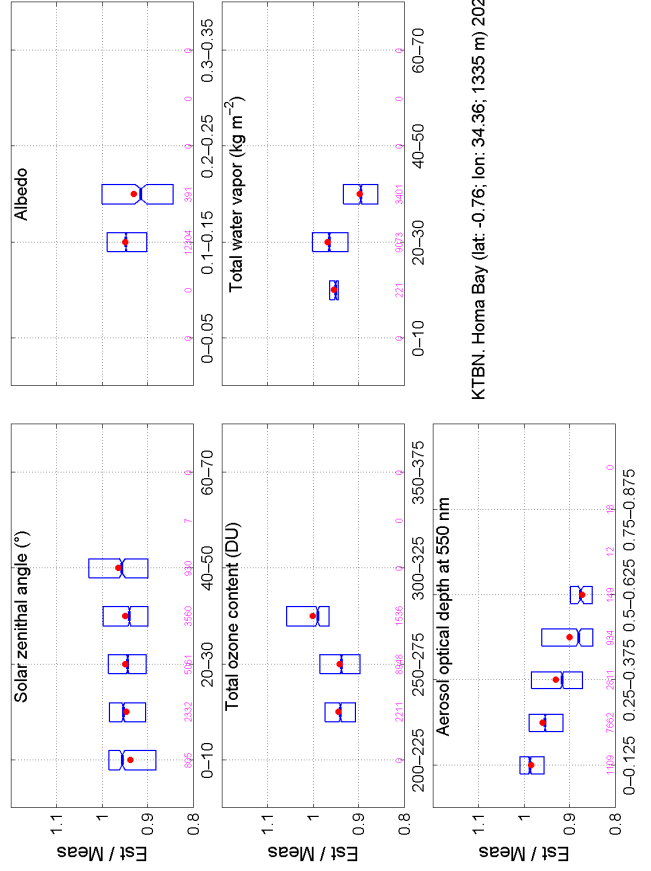
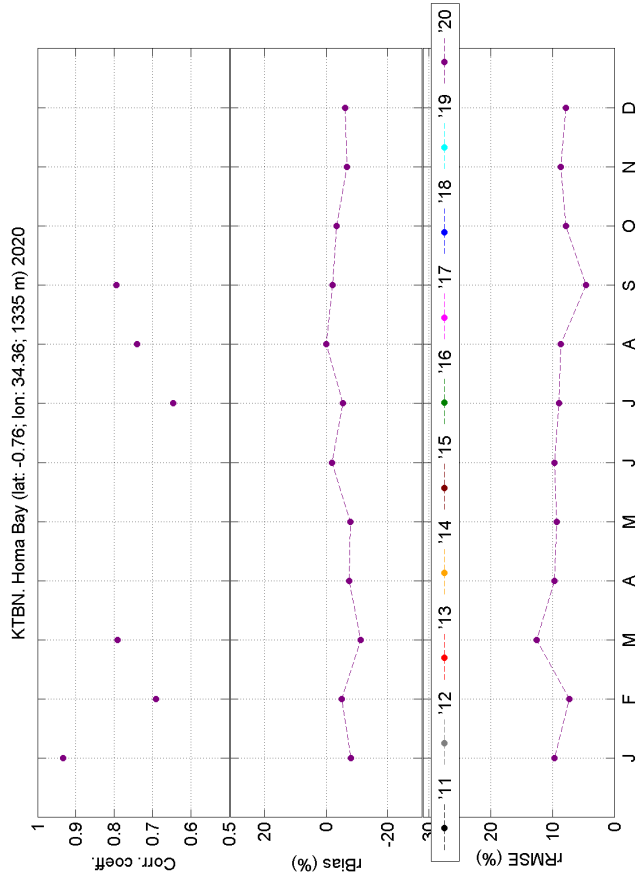
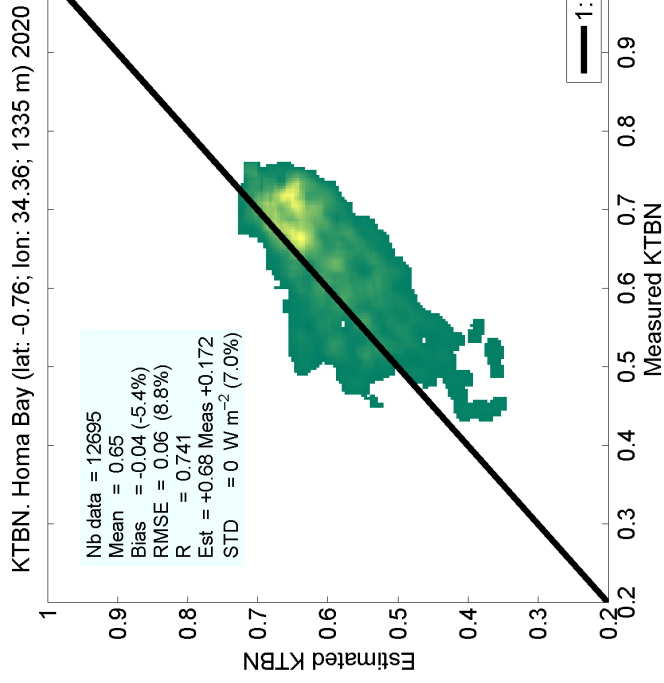


Figure S36: Comparison on direct clearness index at Homa Bay

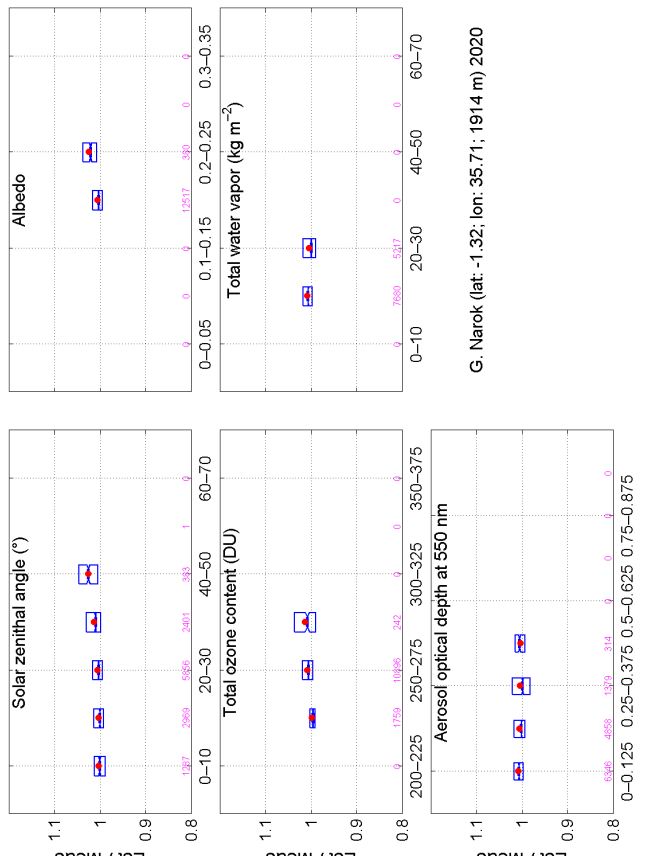
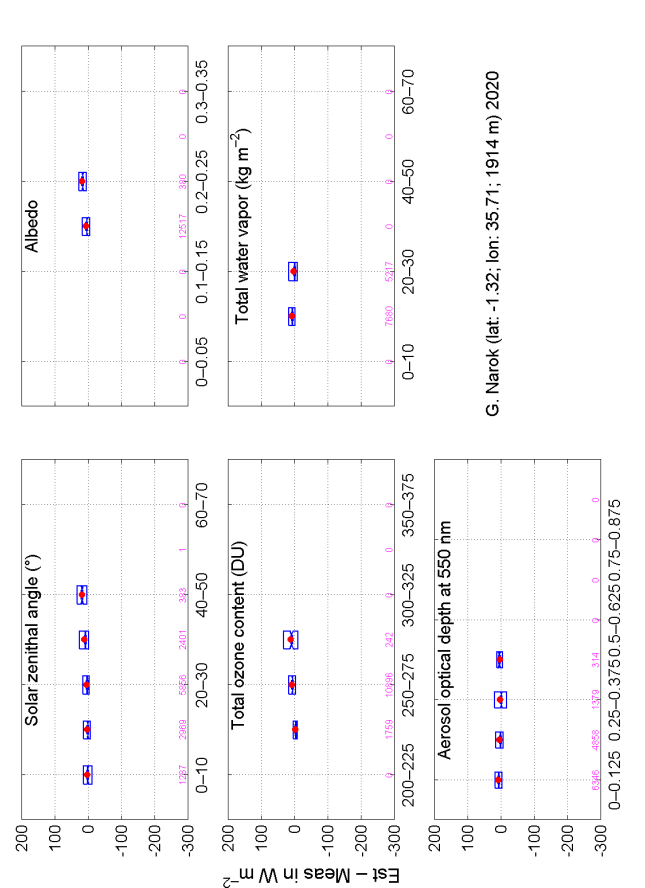
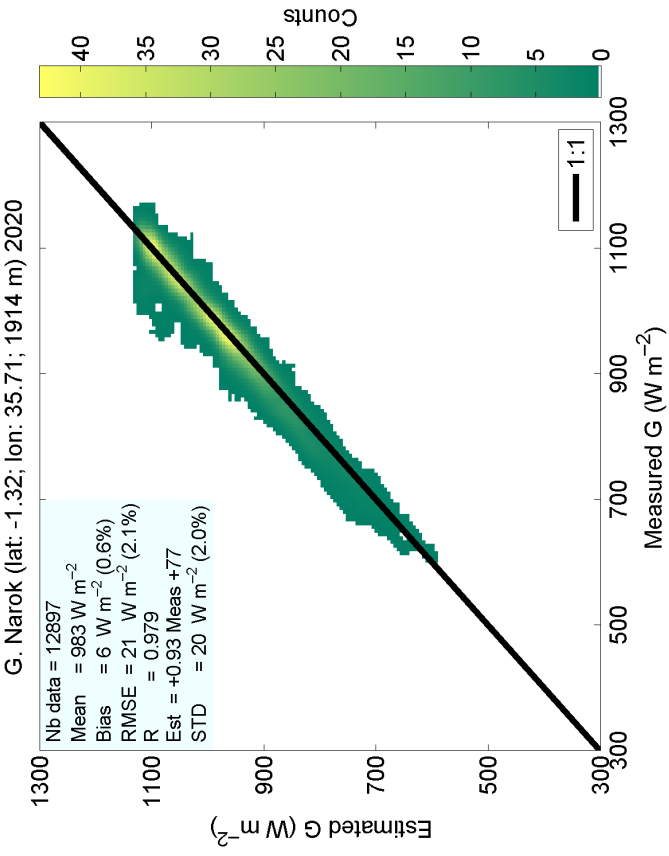
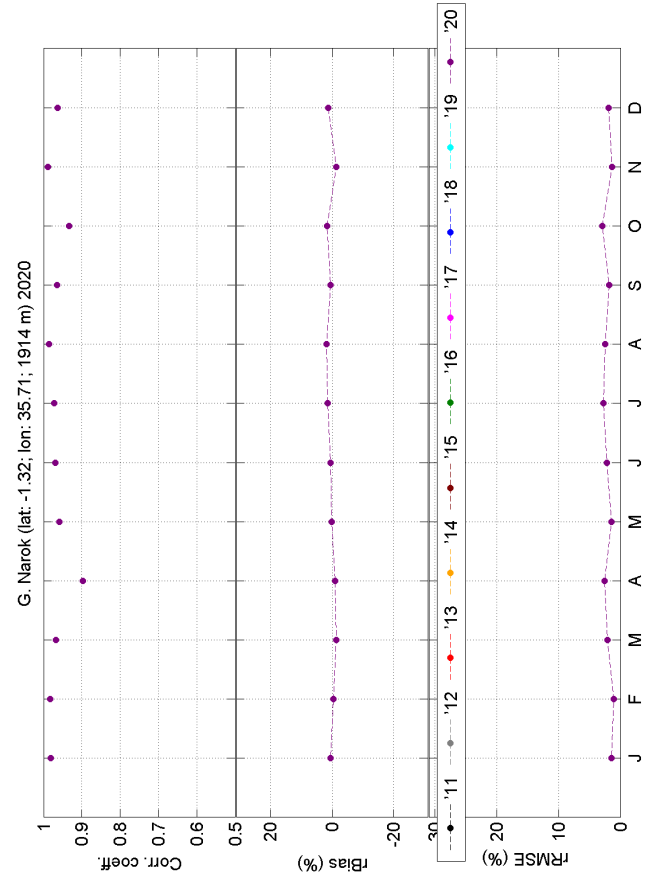


Figure S37: Comparison on global irradiance at Narok

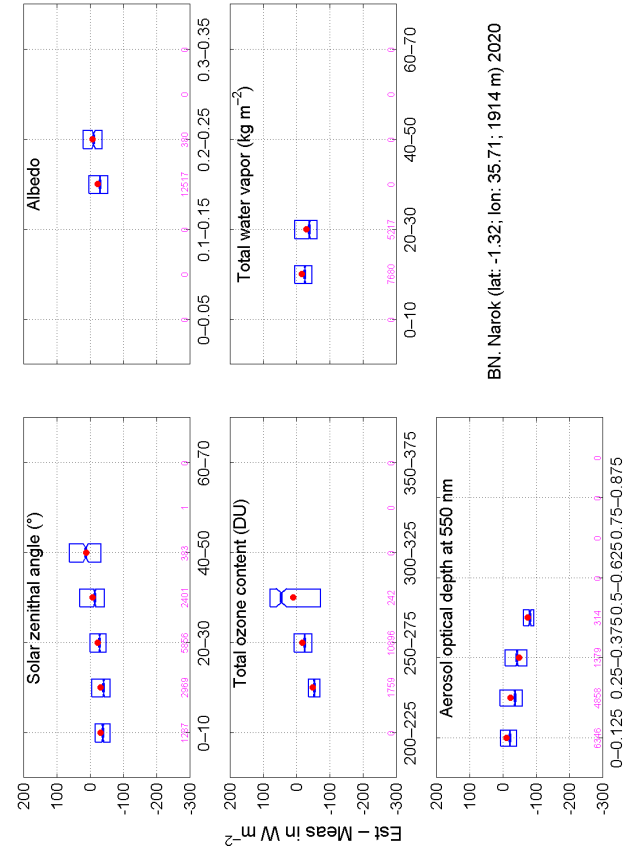
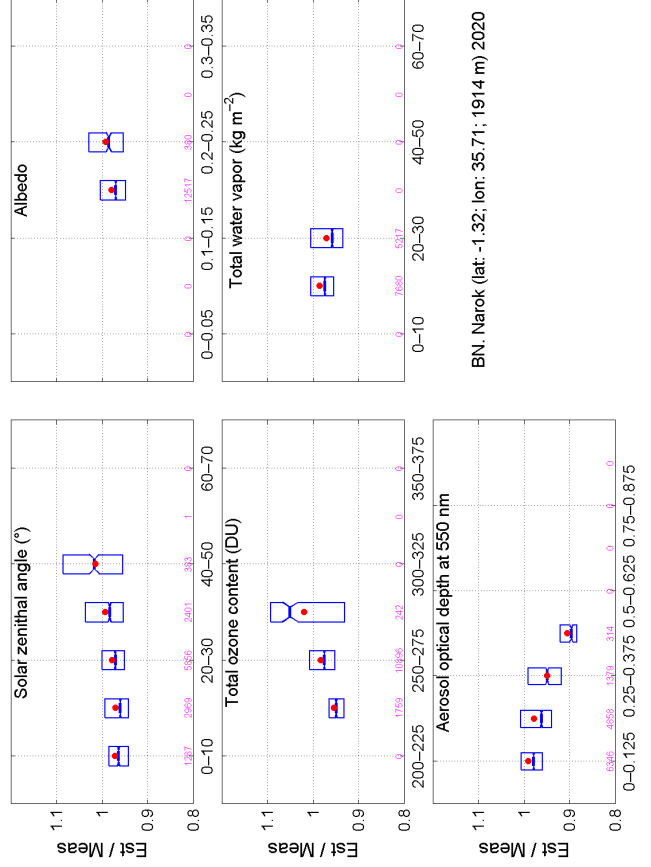
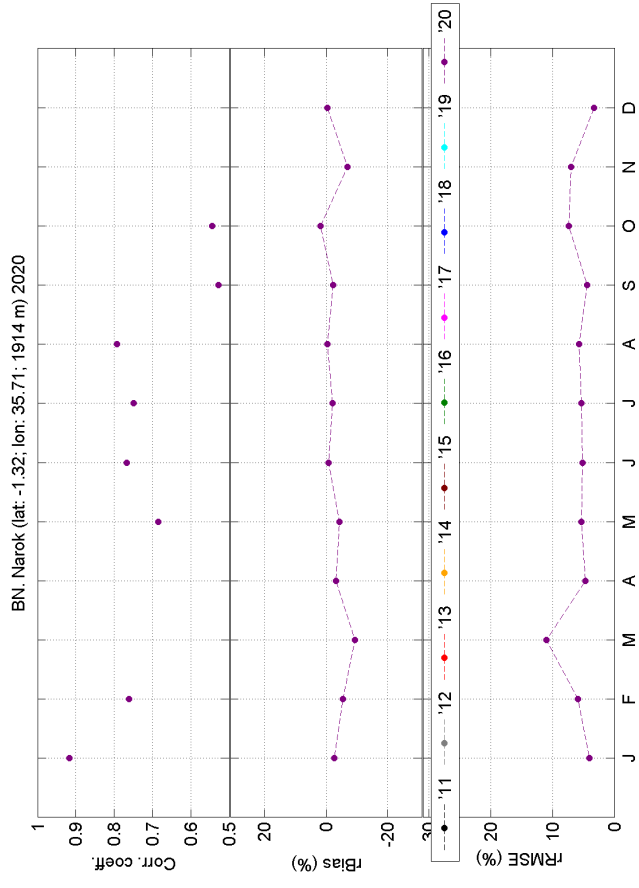
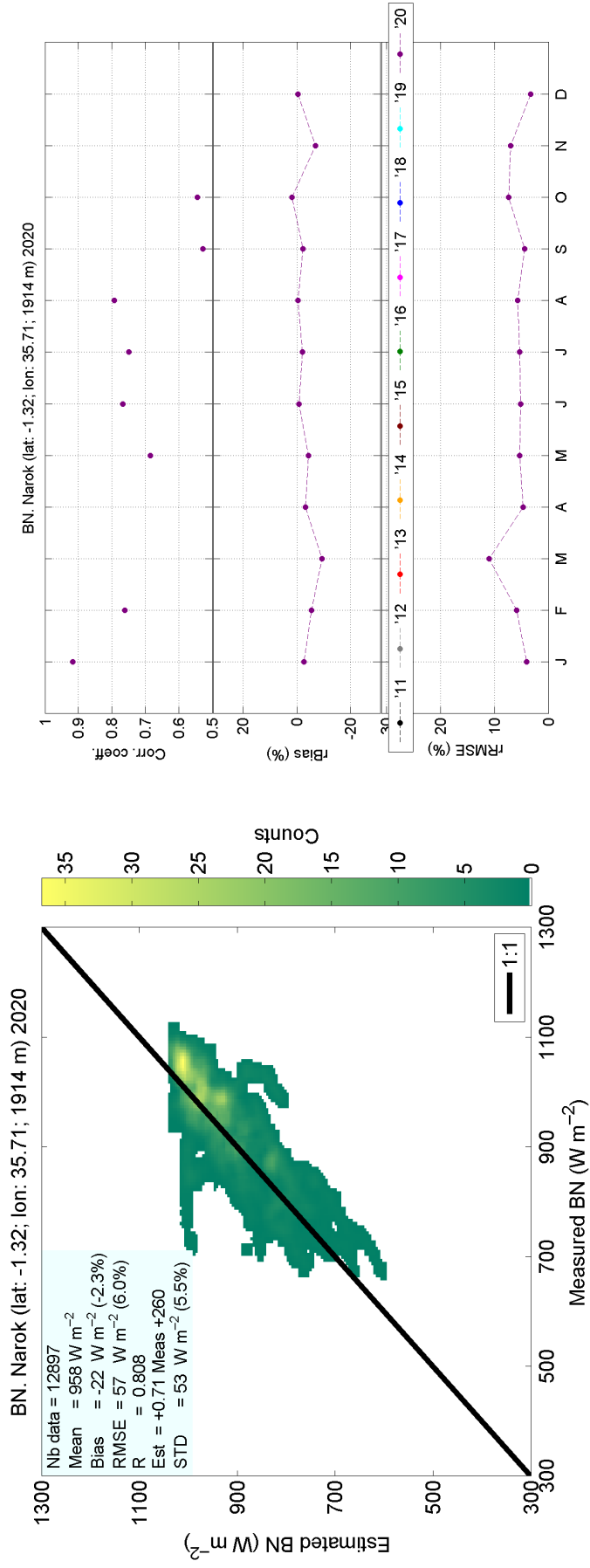


Figure S38: Comparison on direct component at normal irradiance at Narok

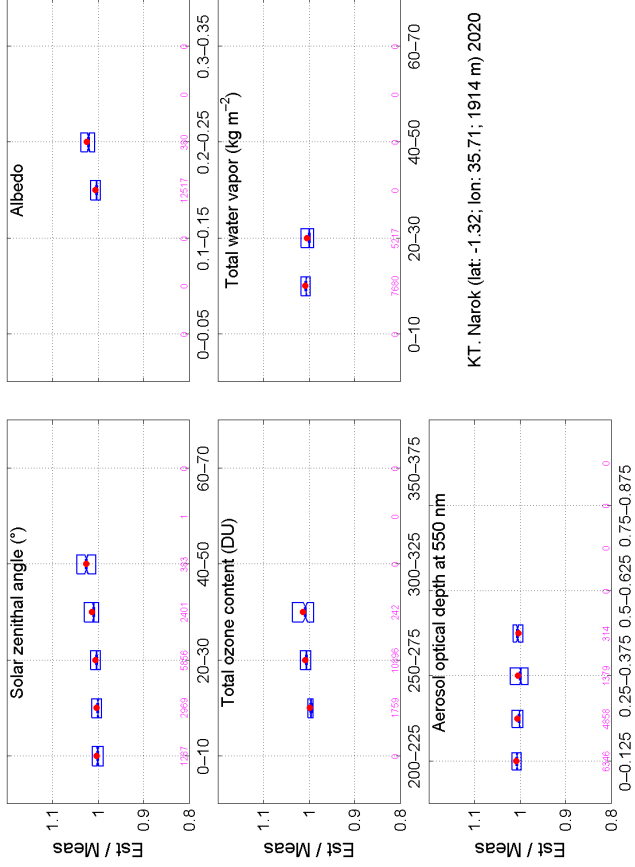
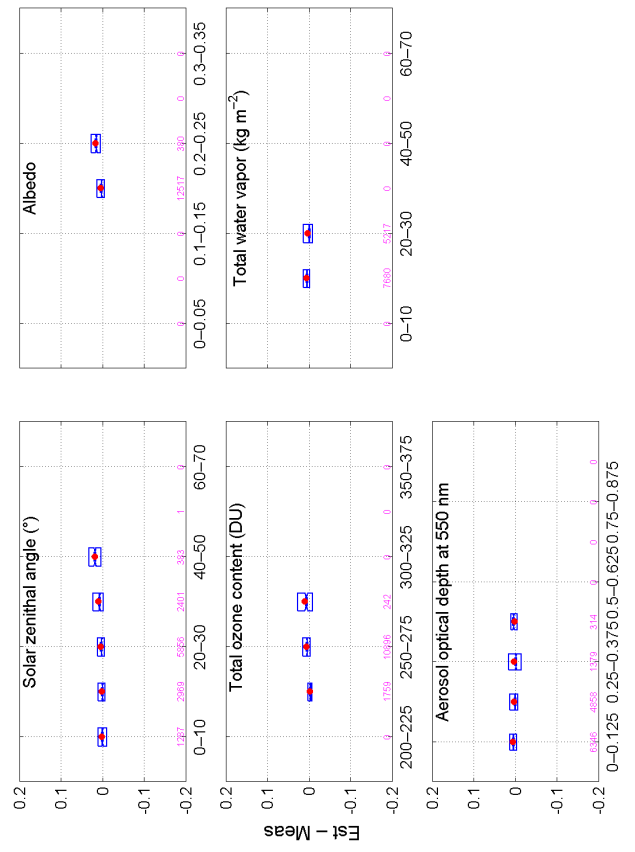
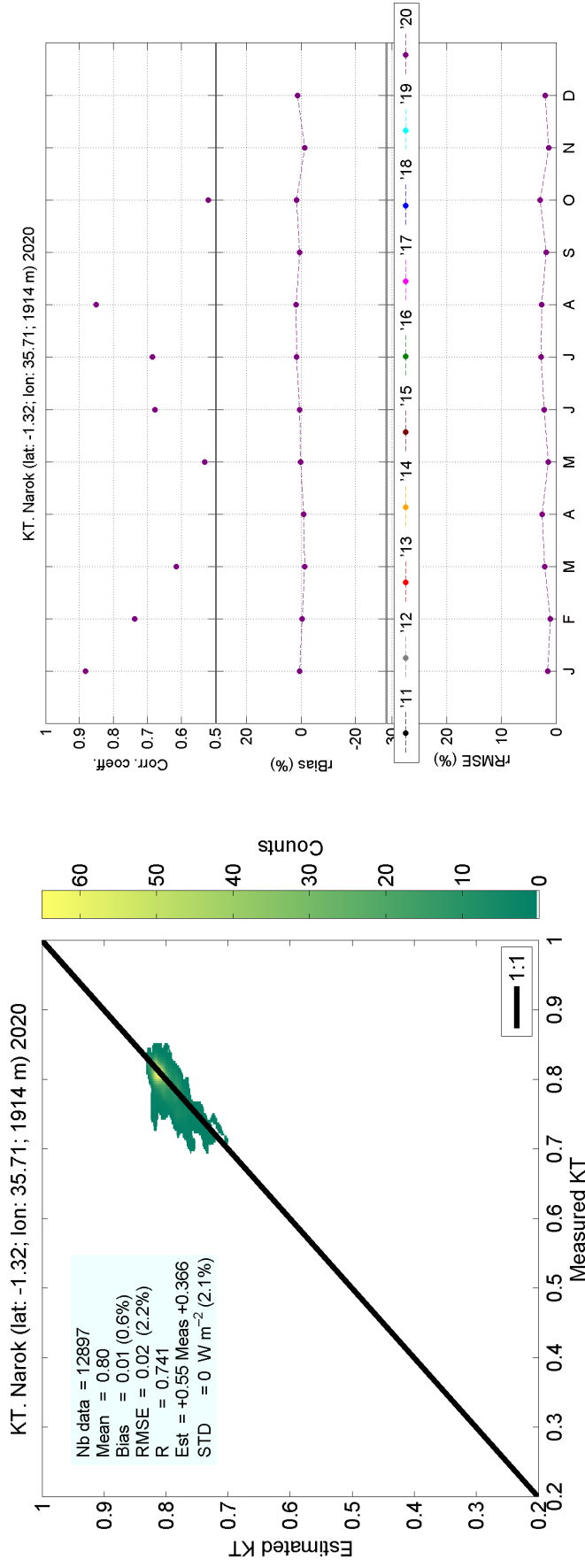


Figure S39: Comparison on clearness index at Narok

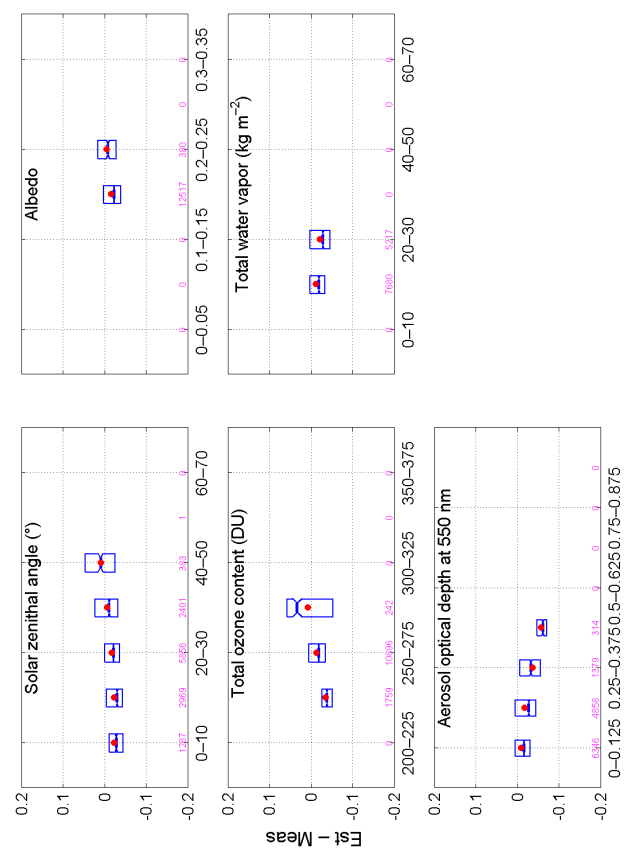
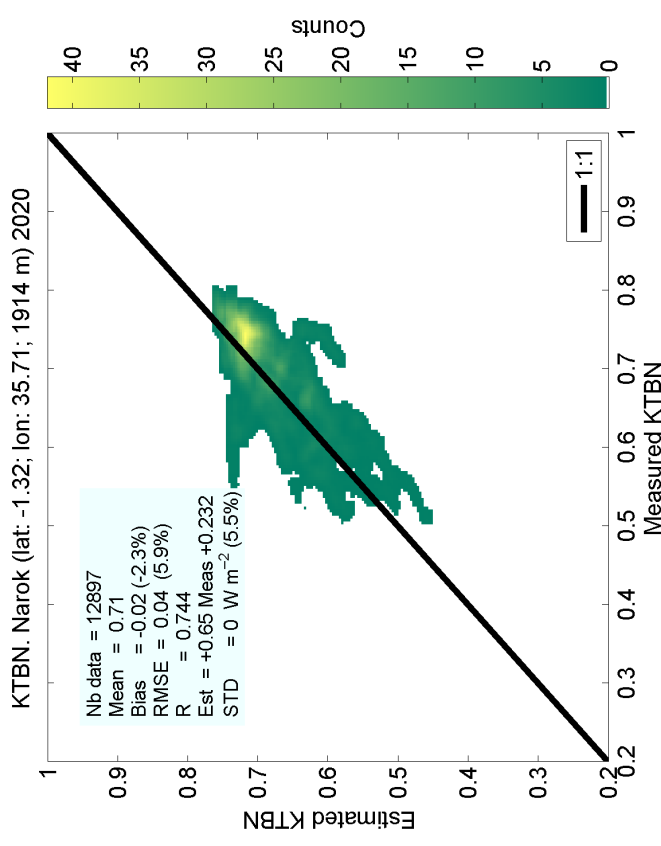
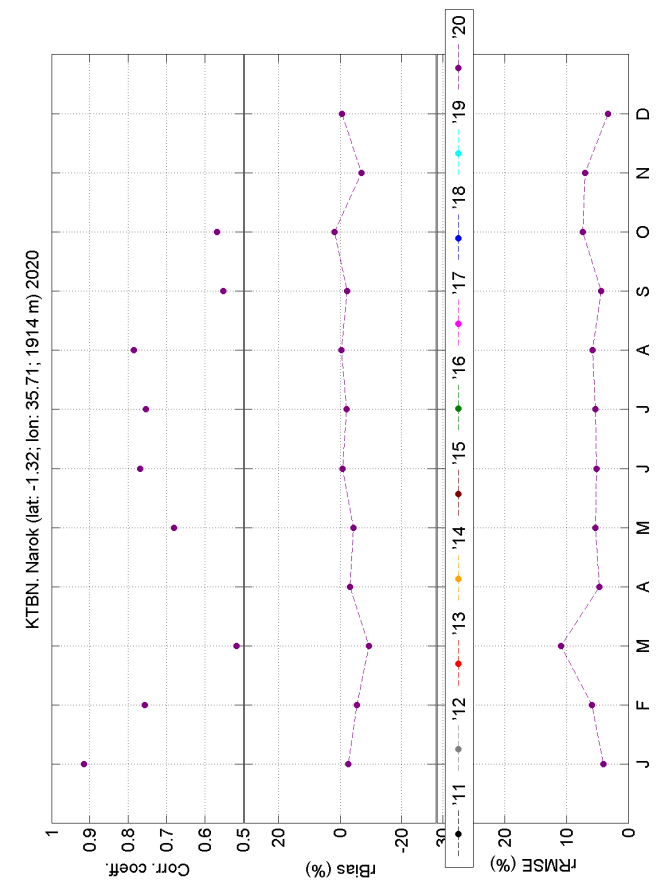
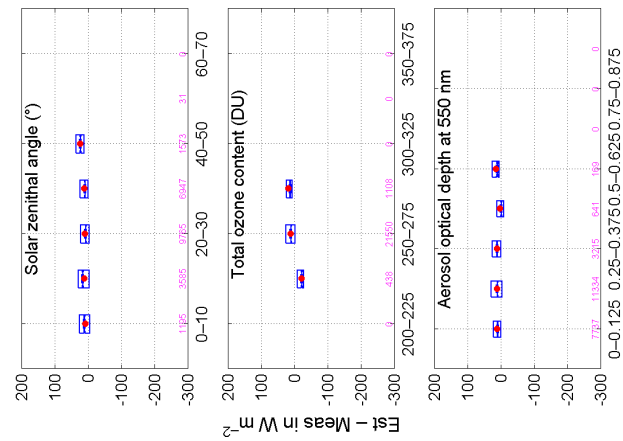
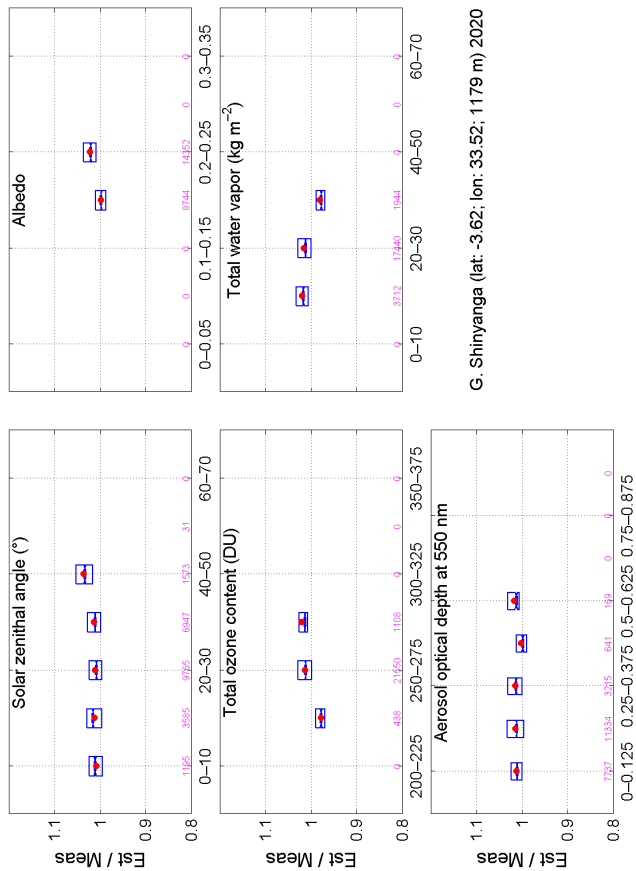
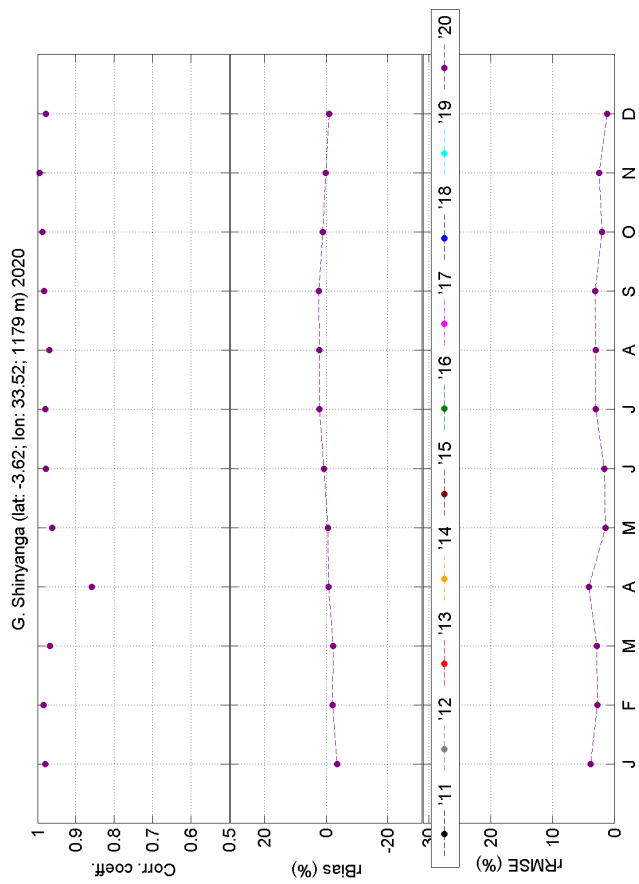
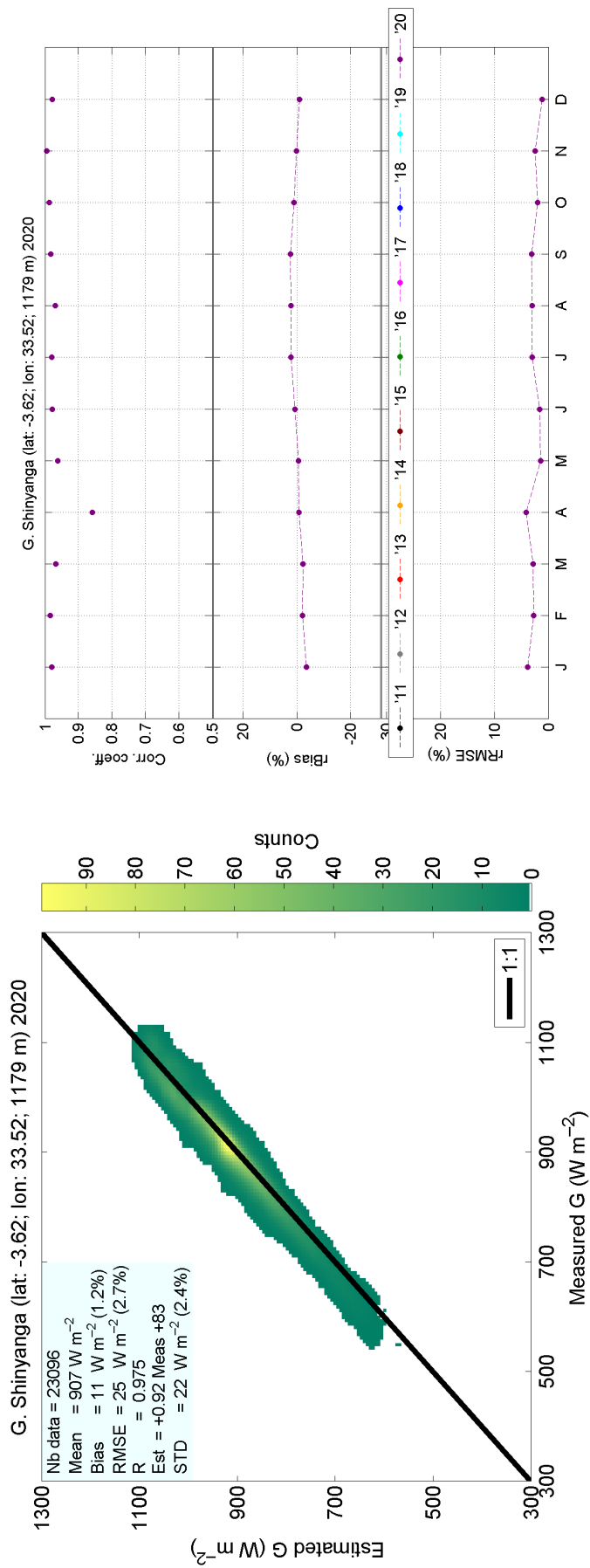


Figure S40: Comparison on direct clearness index at Narok



G. Shinyanga (lat: -3.62; lon: 33.52; 1179 m) 2020

G. Shinyanga (lat: -3.62; lon: 33.52; 1179 m) 2020

Figure S41: Comparison on global irradiance at Shinyanga

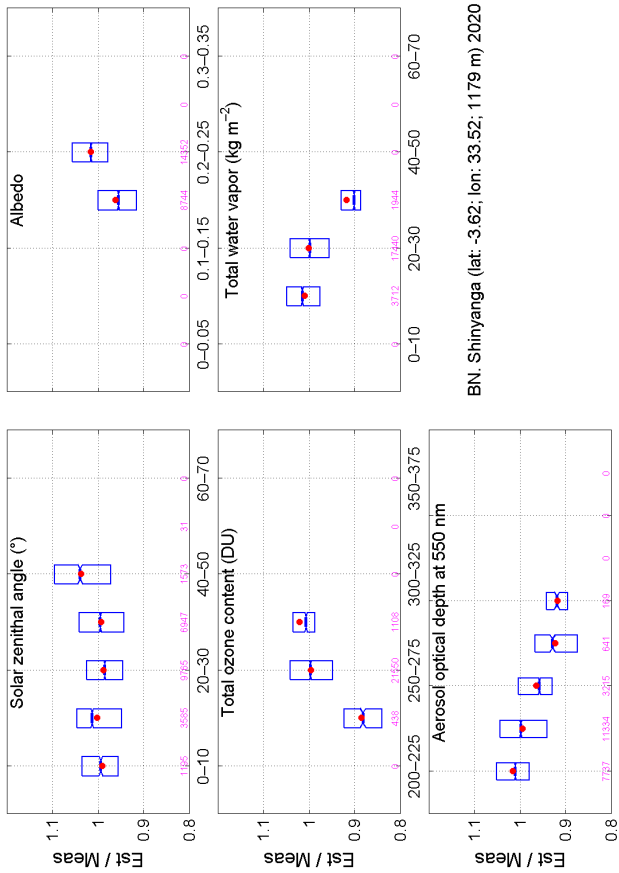
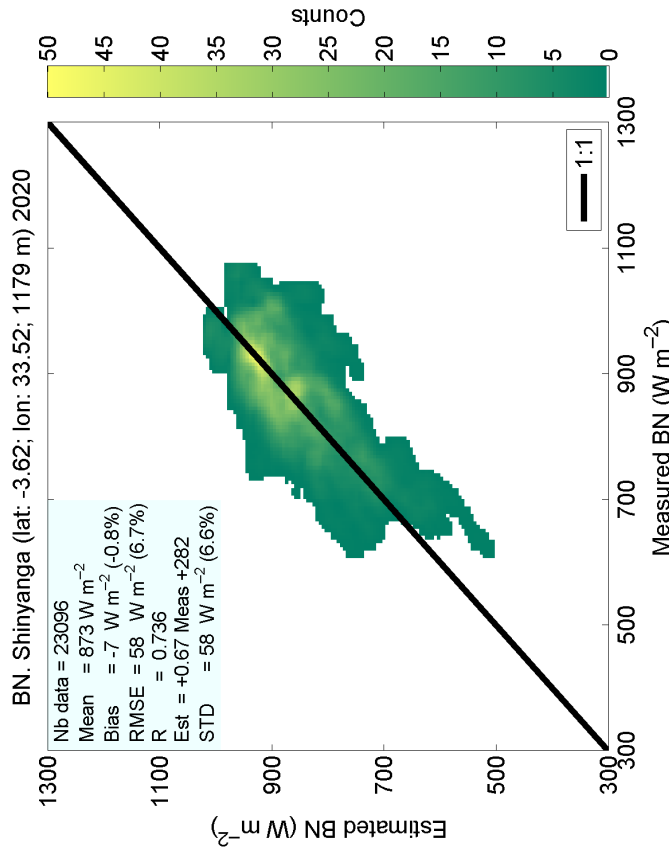
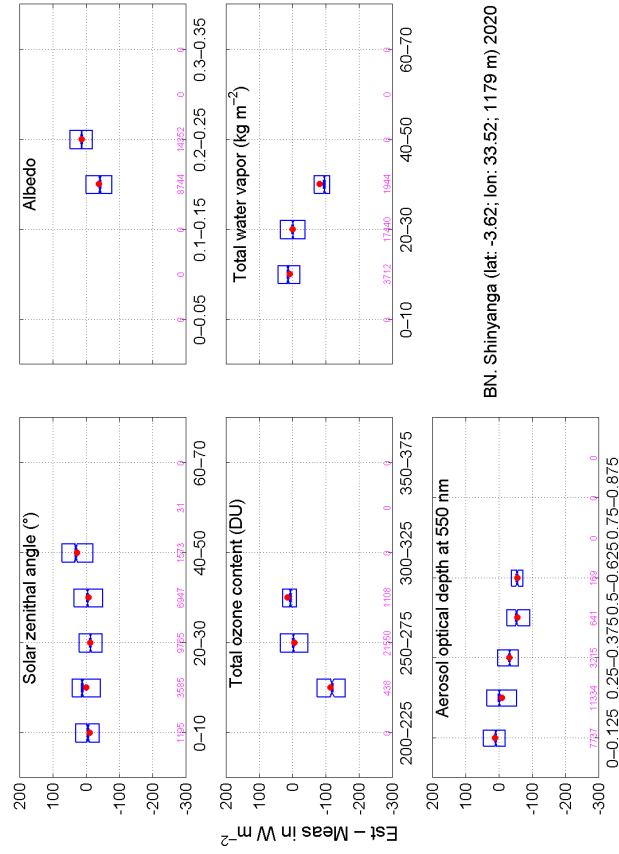
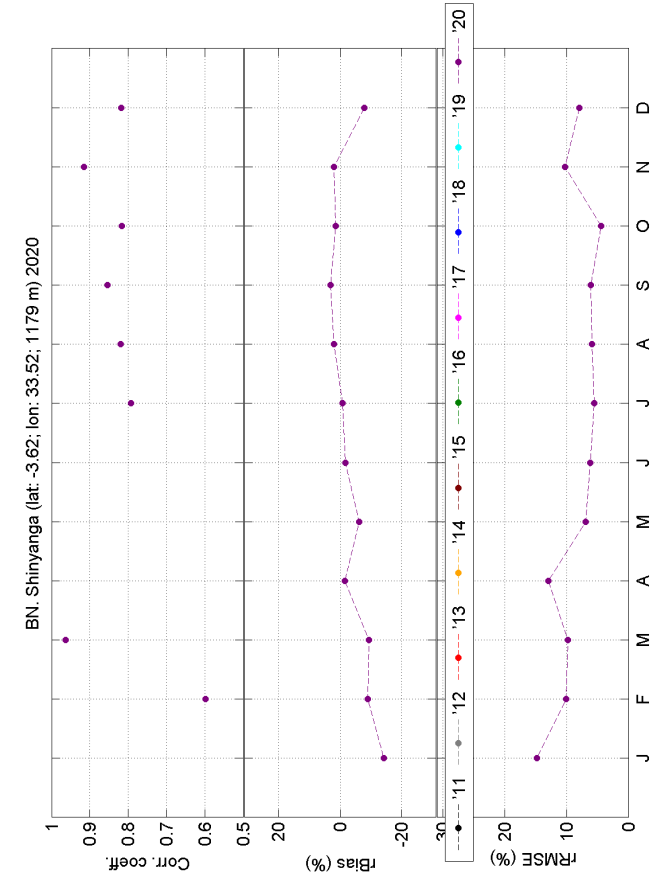


Figure S42: Comparison on direct component at normal irradiance at Shinyanga

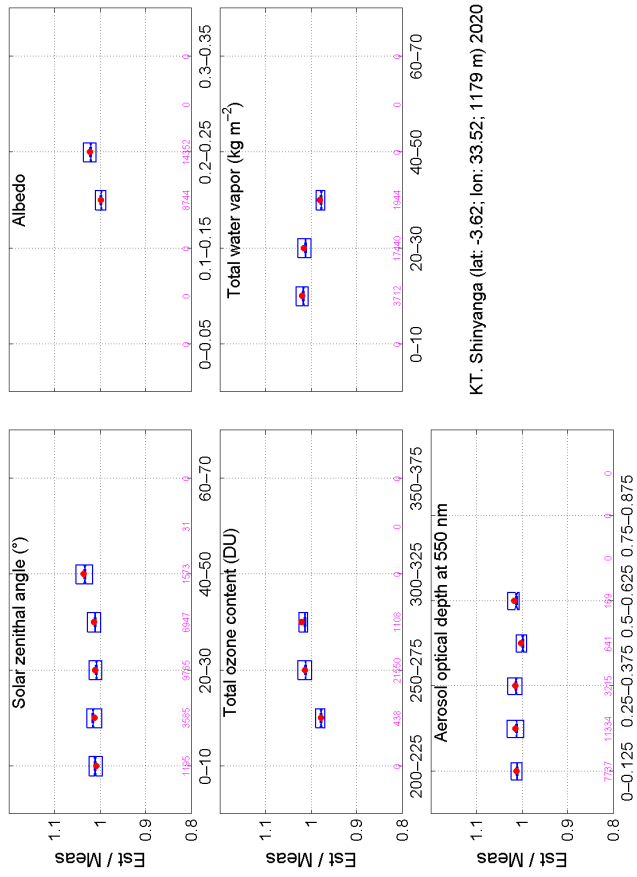
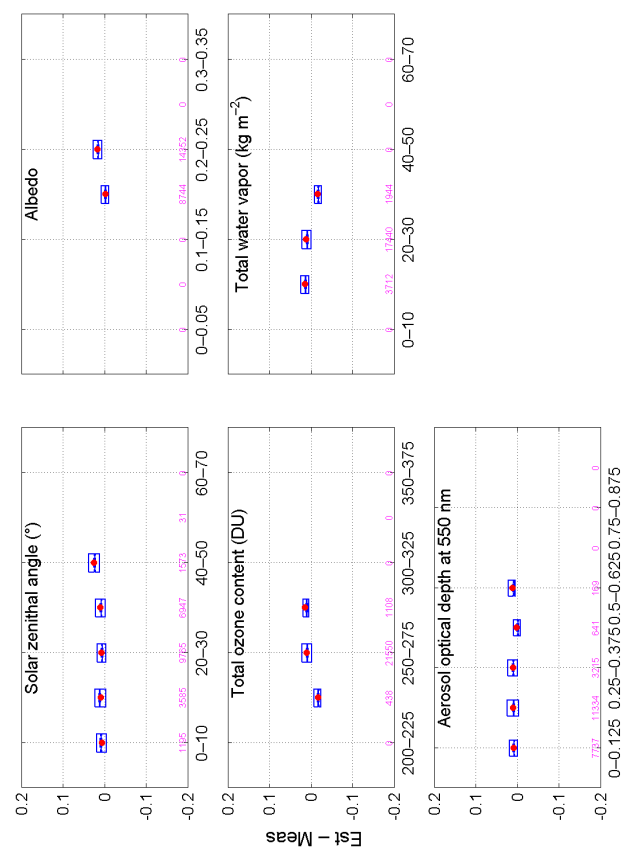
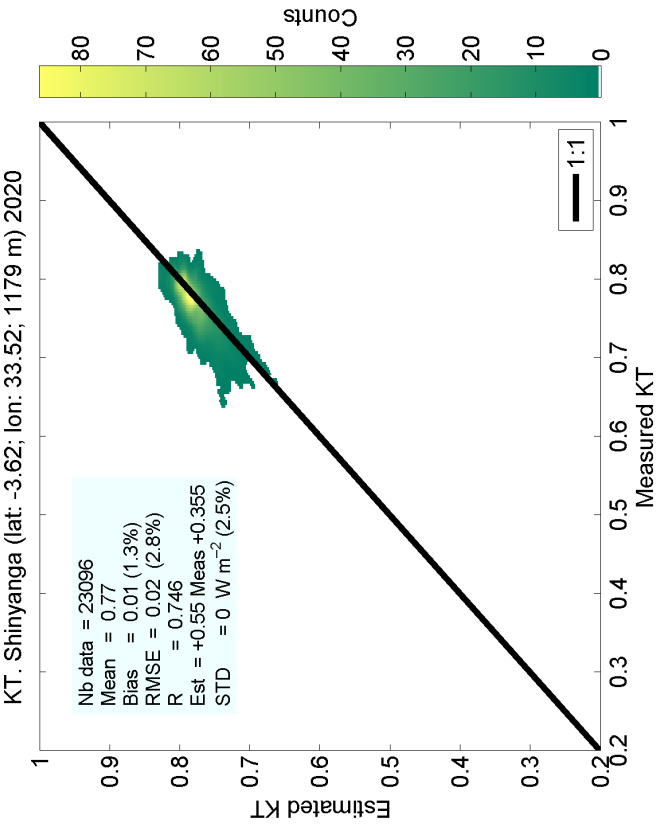
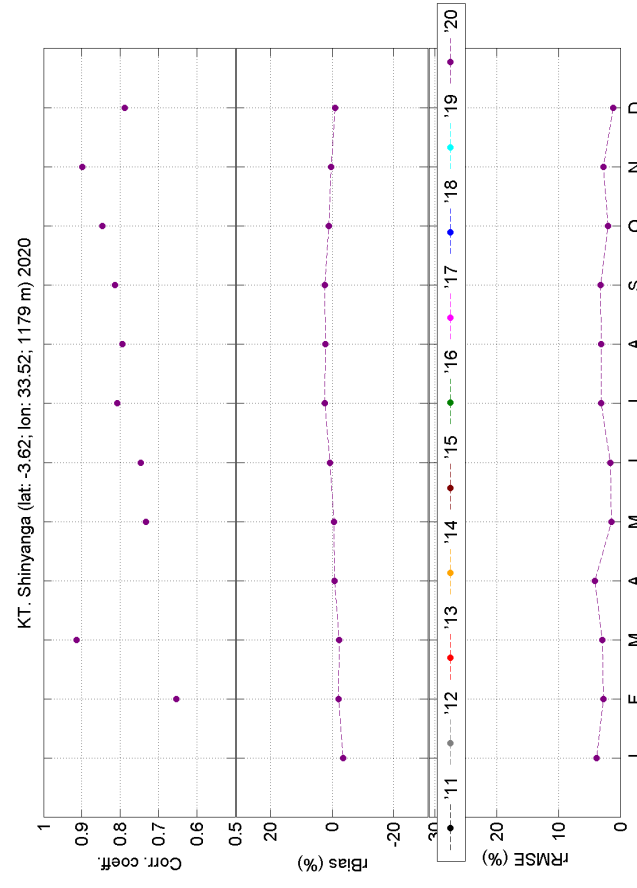


Figure S43: Comparison on clearness index at Shinyanga

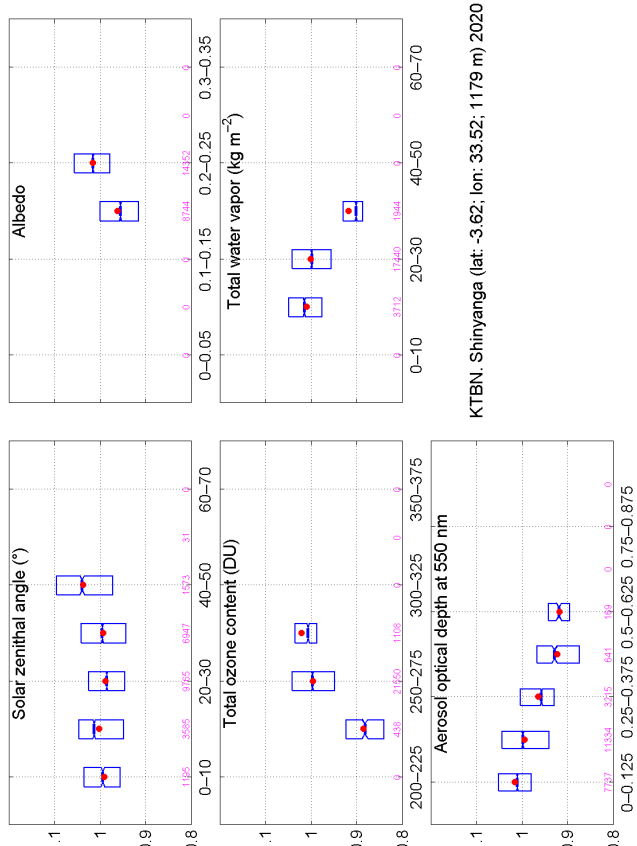
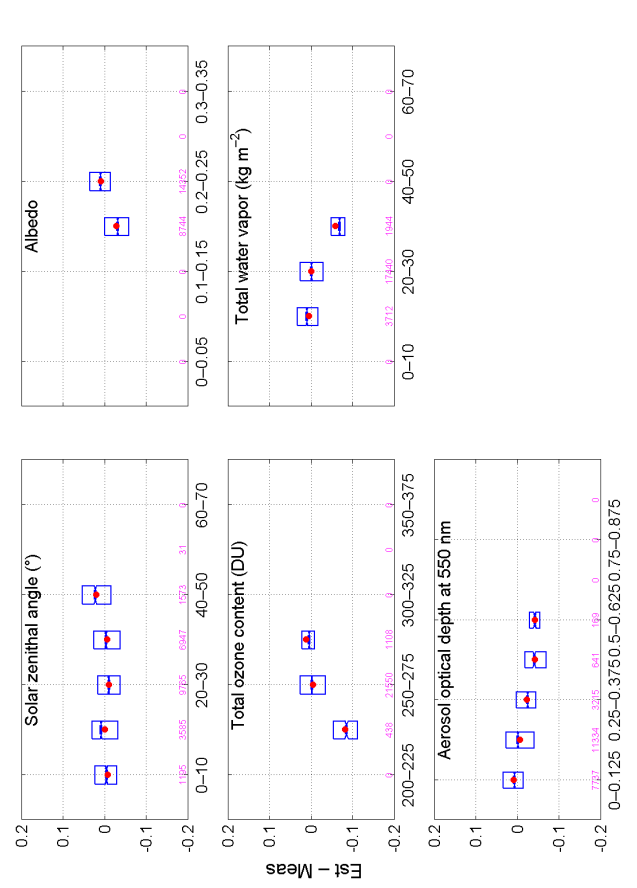
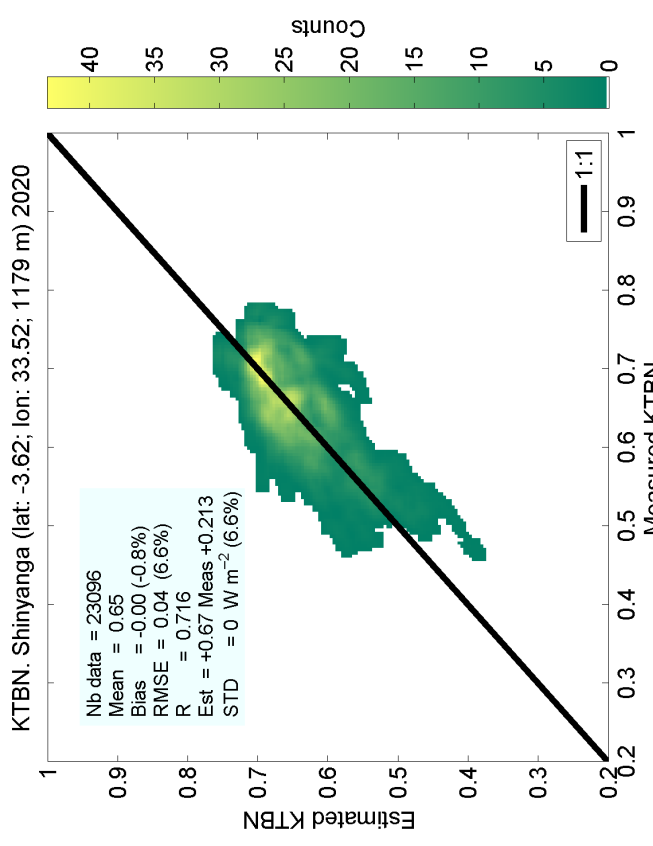
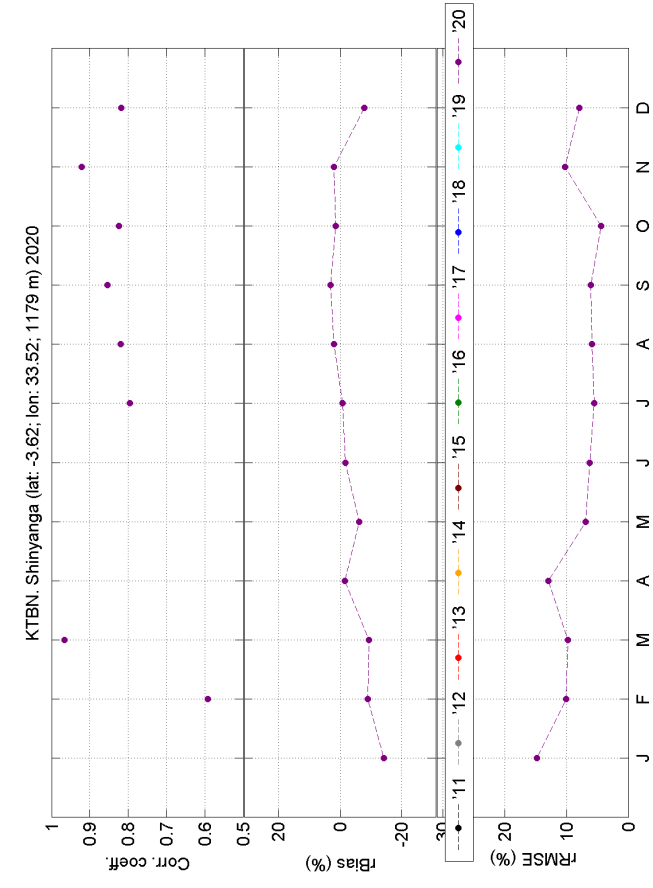


Figure S44: Comparison on direct clearness index at Shinyanga

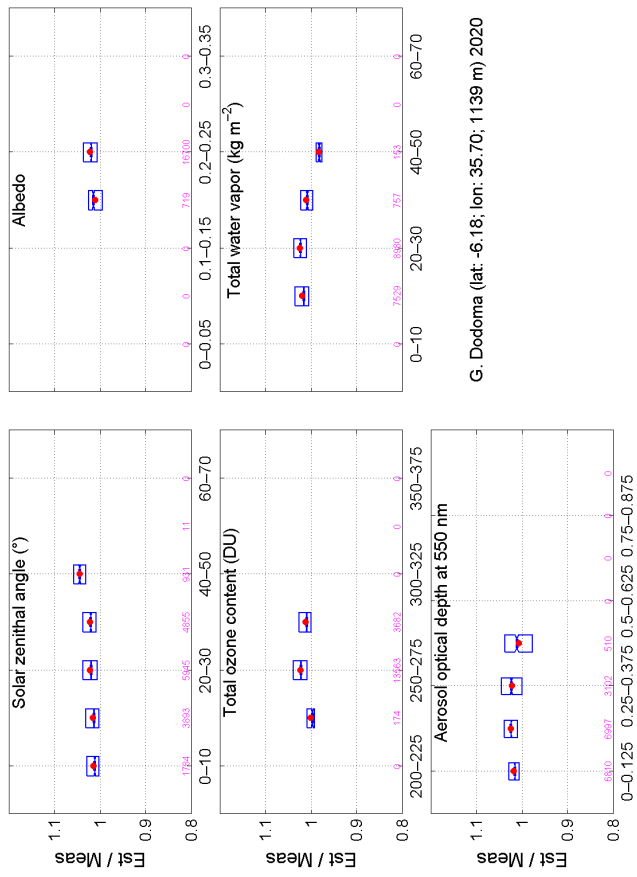
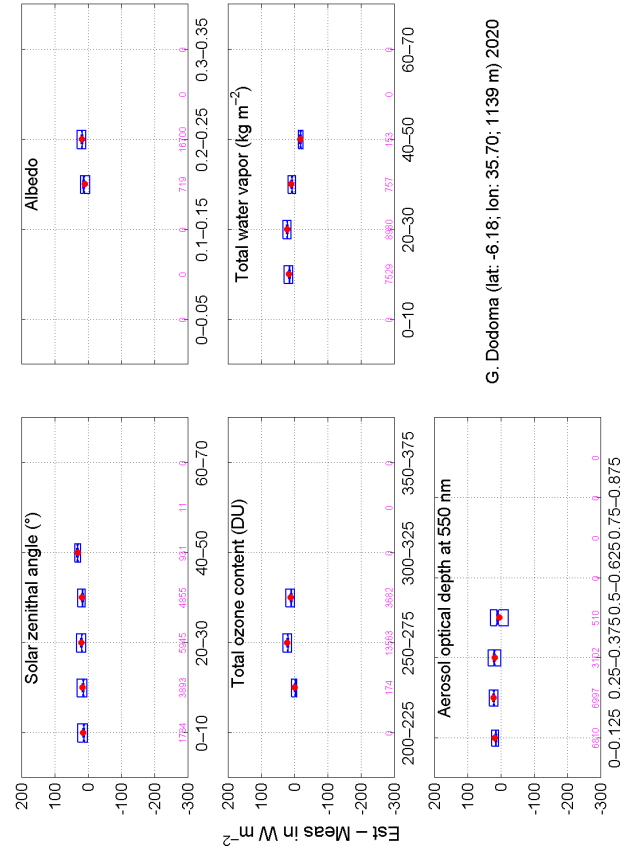
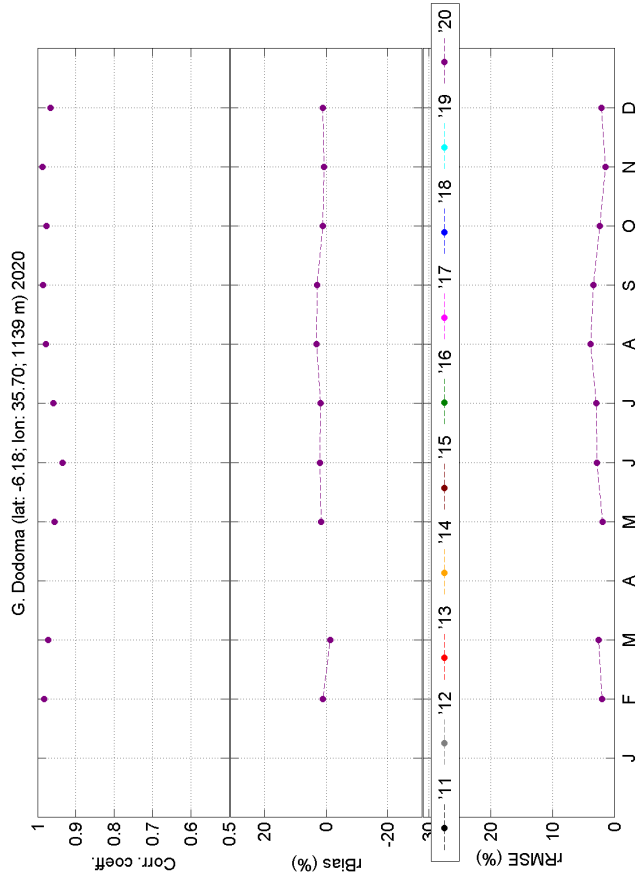
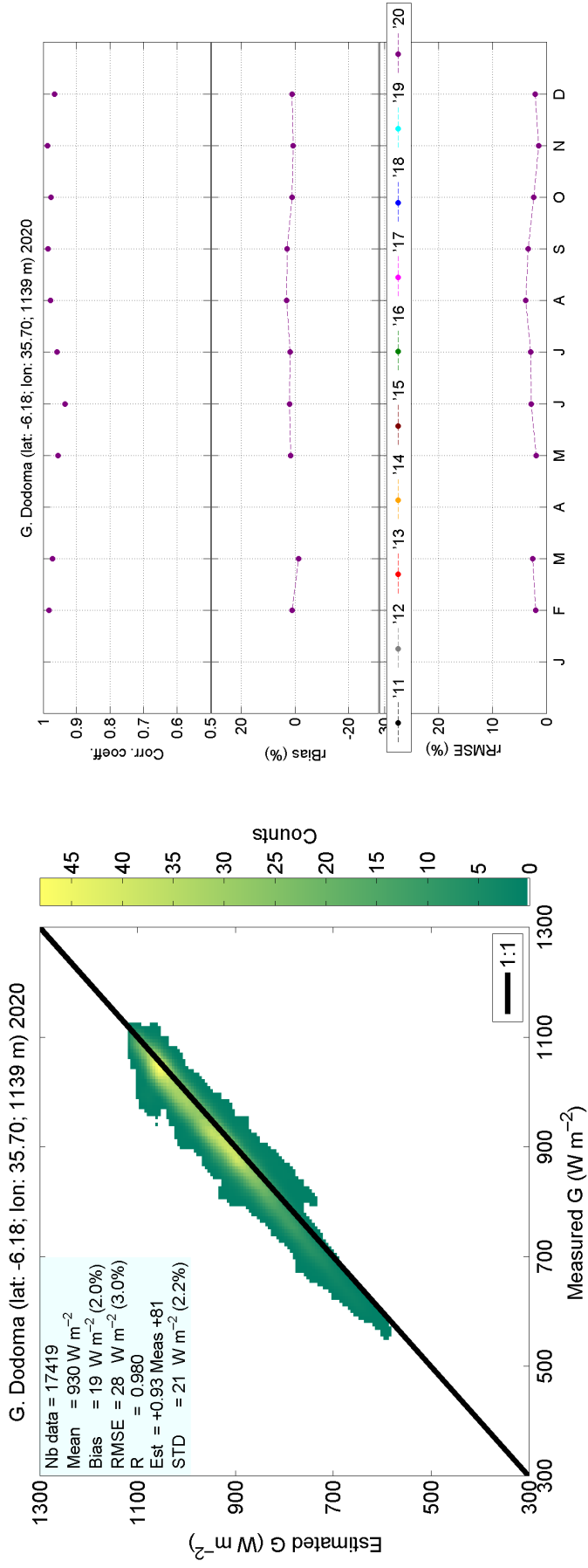


Figure S45: Comparison on global irradiance at Dodoma

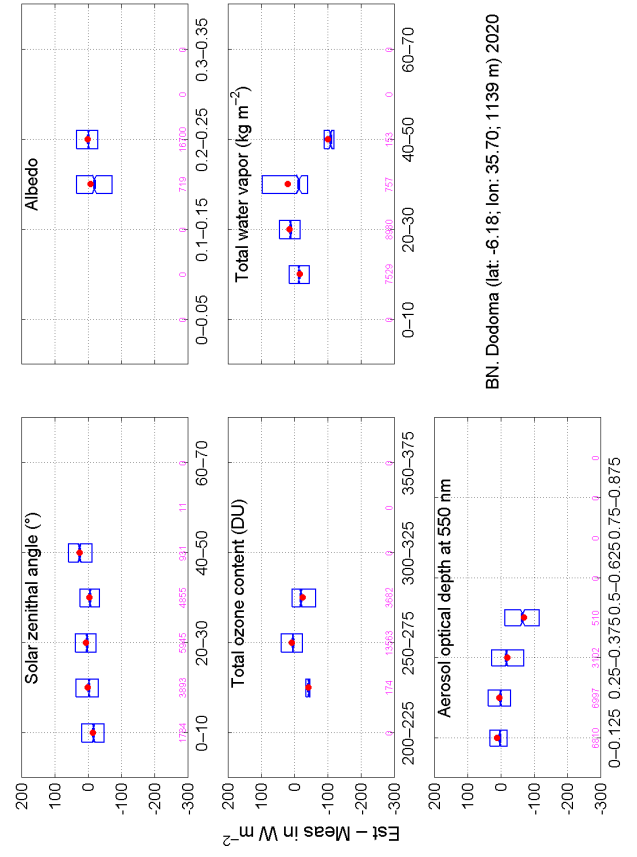
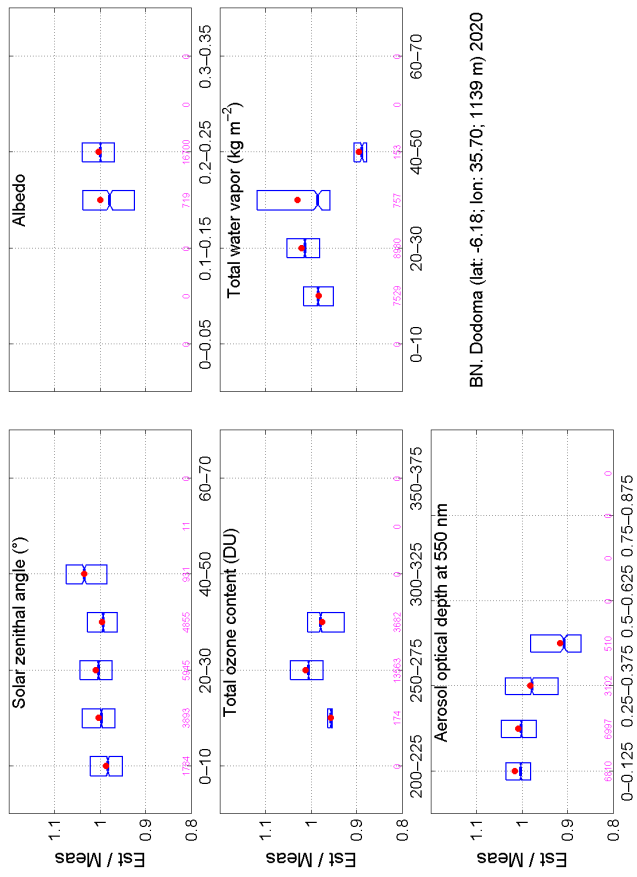
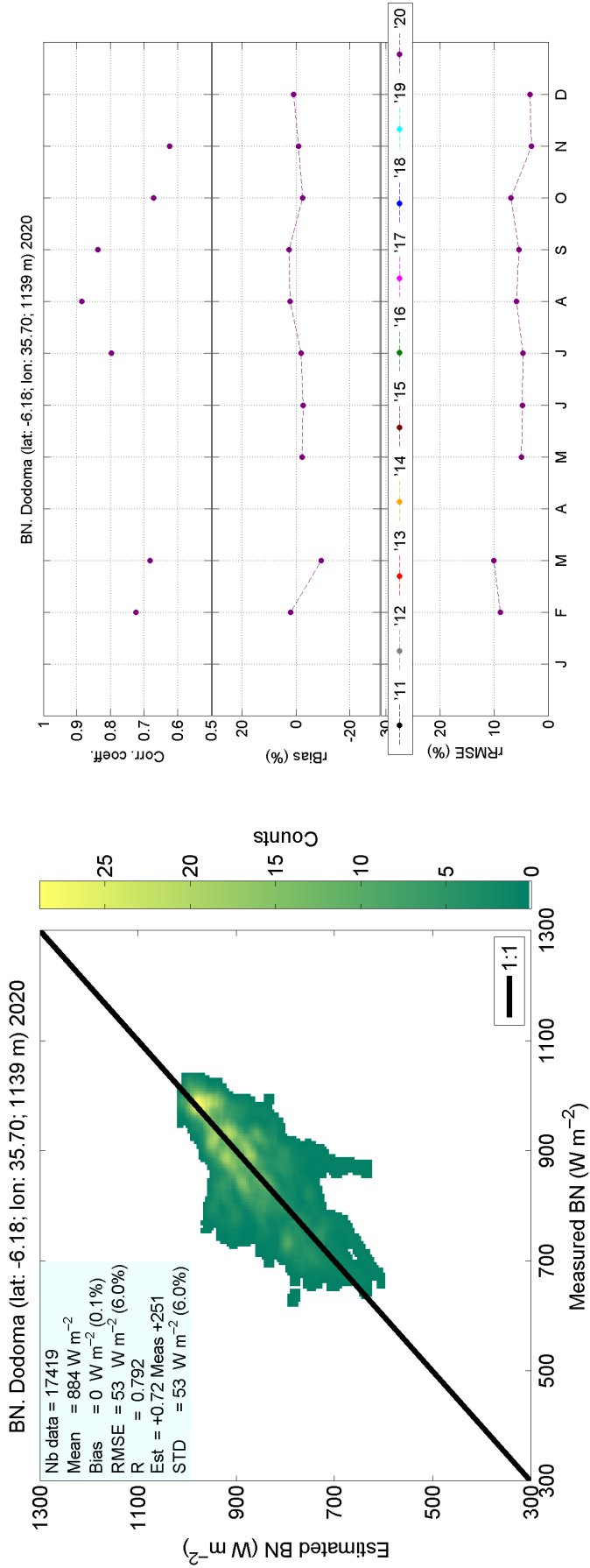


Figure S46: Comparison on direct component at normal irradiance at Dodoma

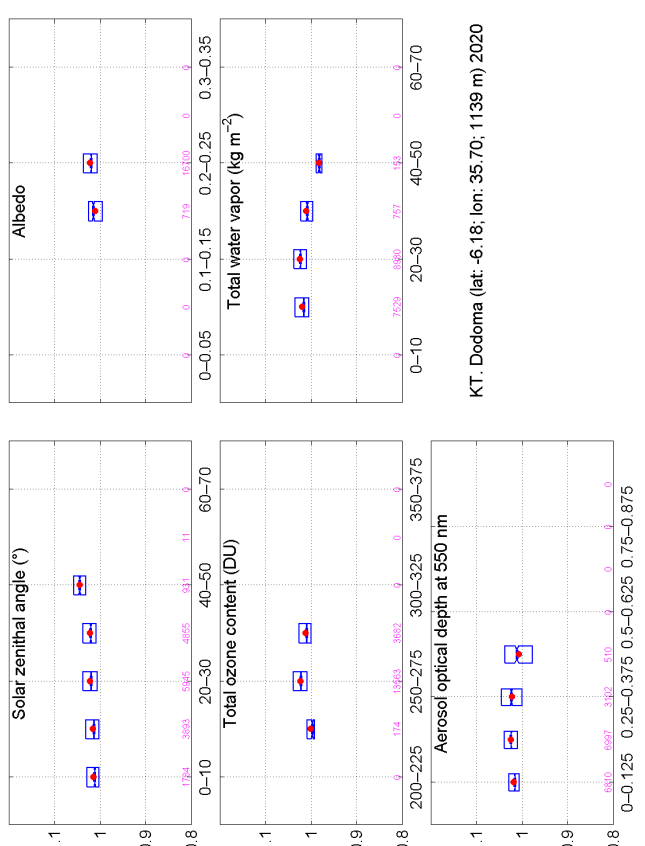
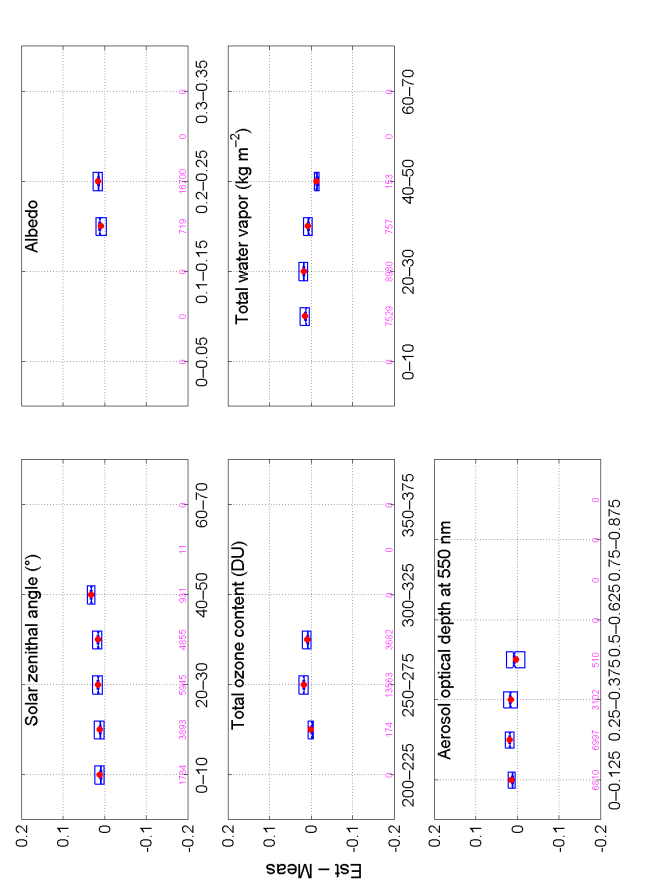
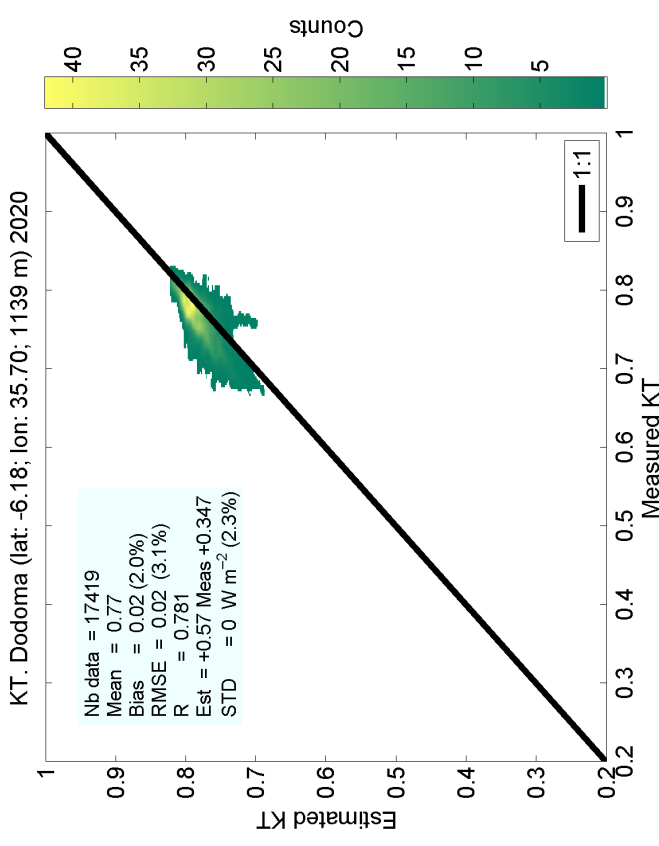
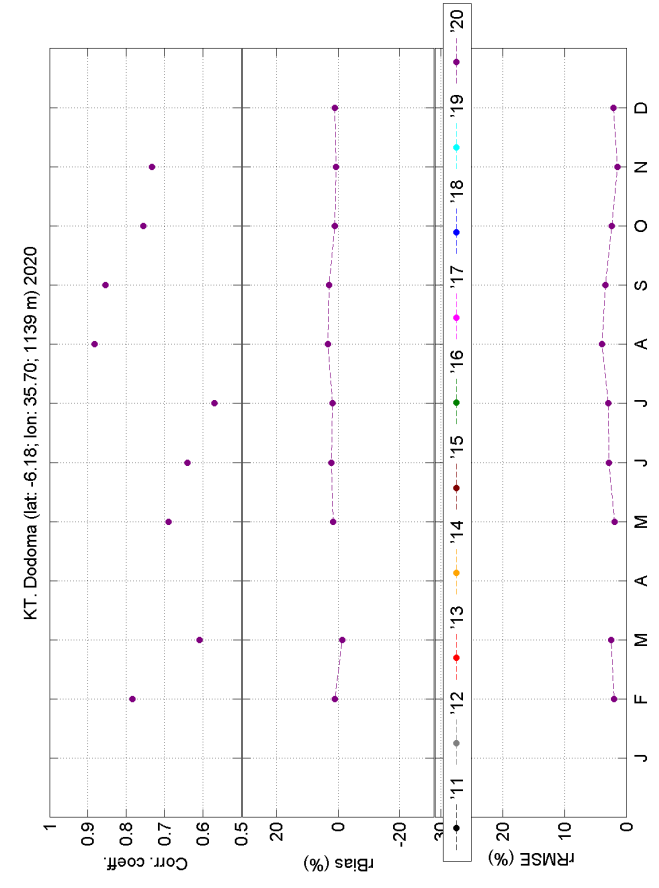


Figure S47: Comparison on clearness index at Dodoma

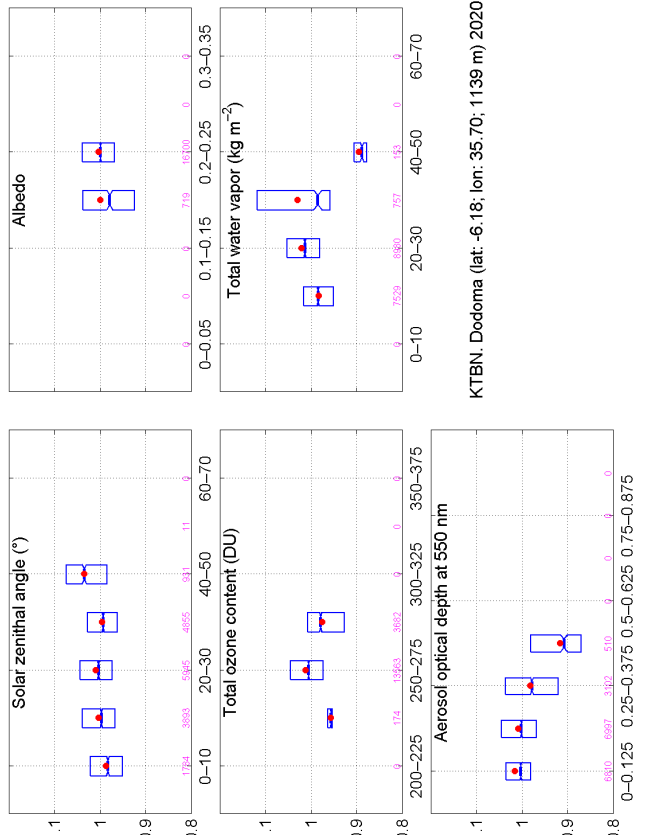
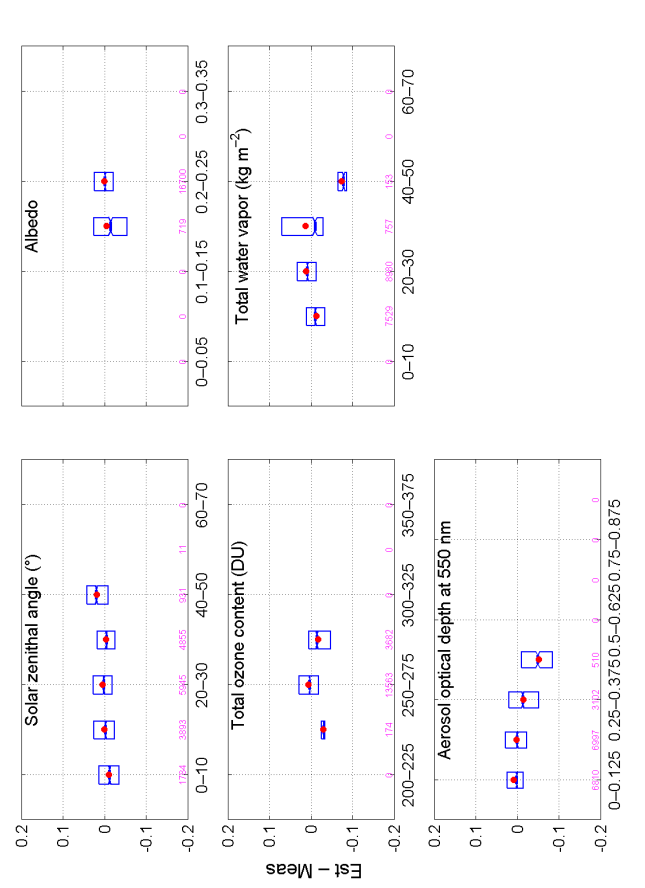
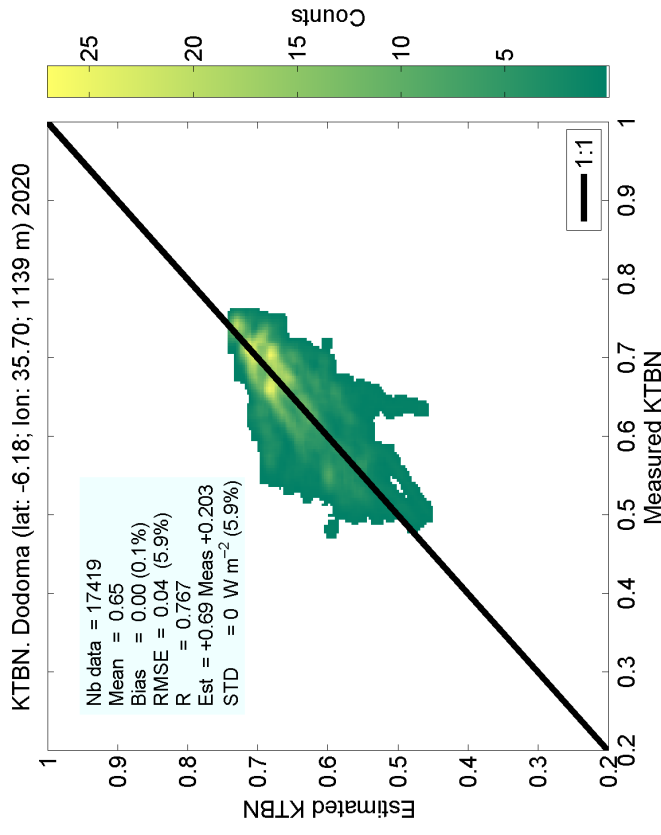
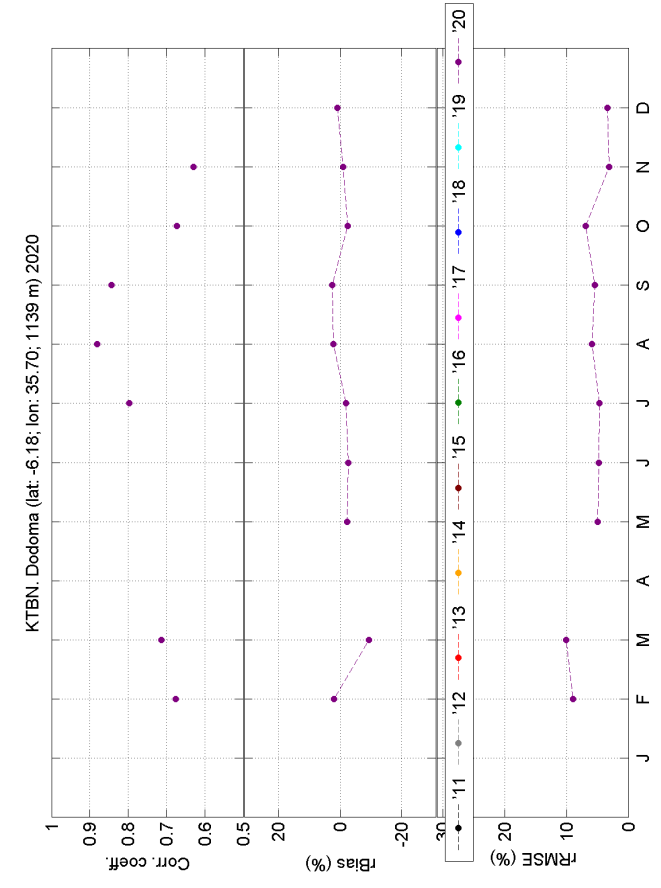


Figure S48: Comparison on direct clearness index at Dodoma

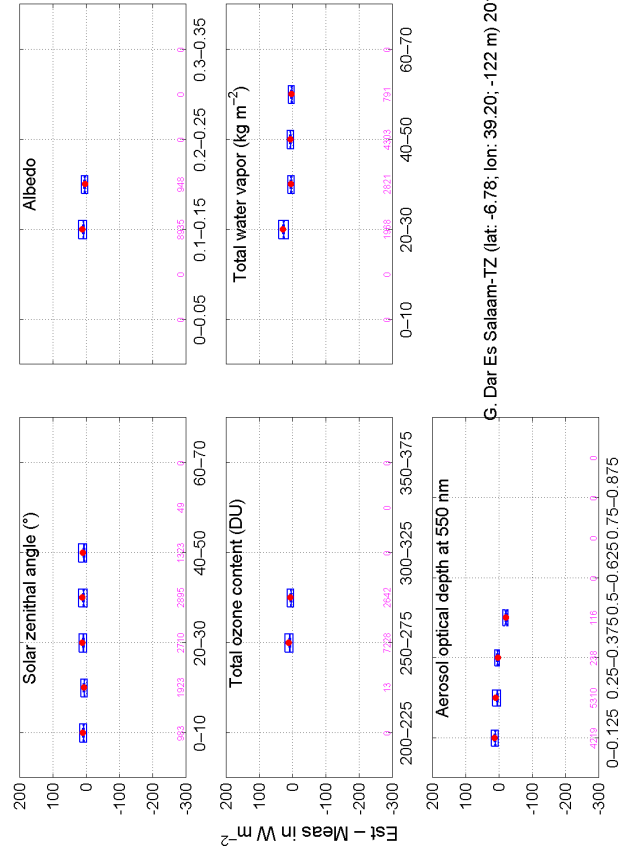
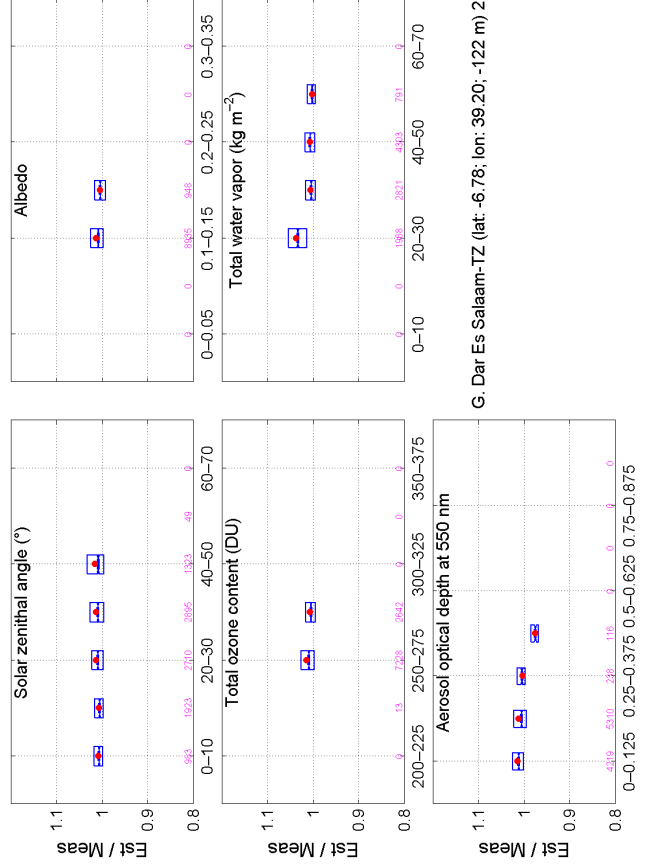
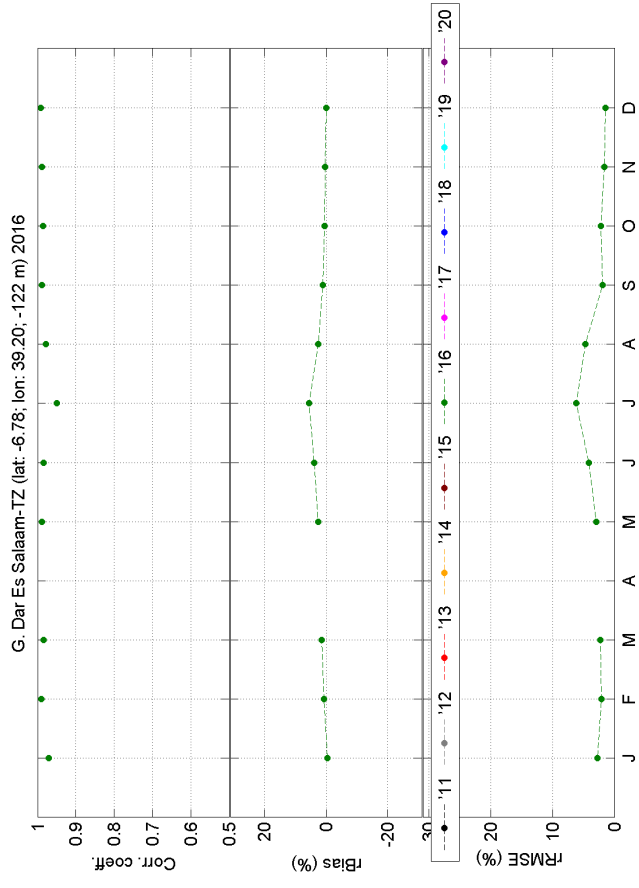
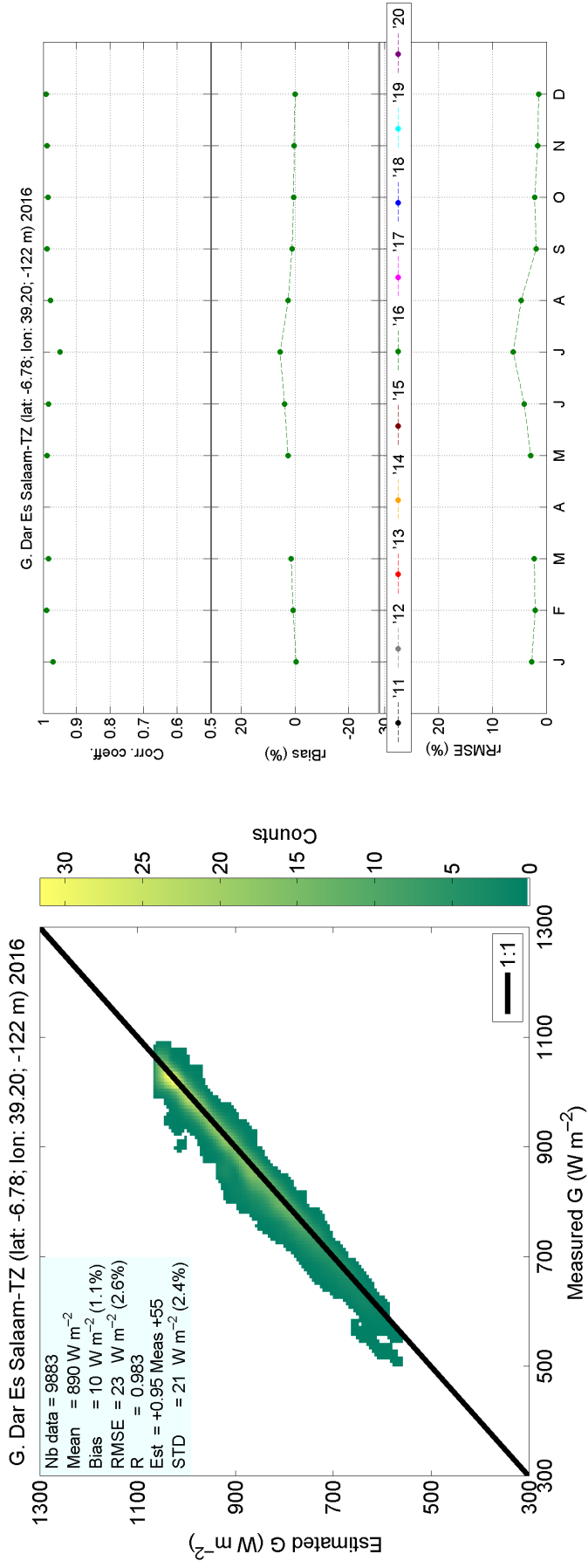


Figure S49: Comparison on global irradiance at Dar Es Salaam-TZ

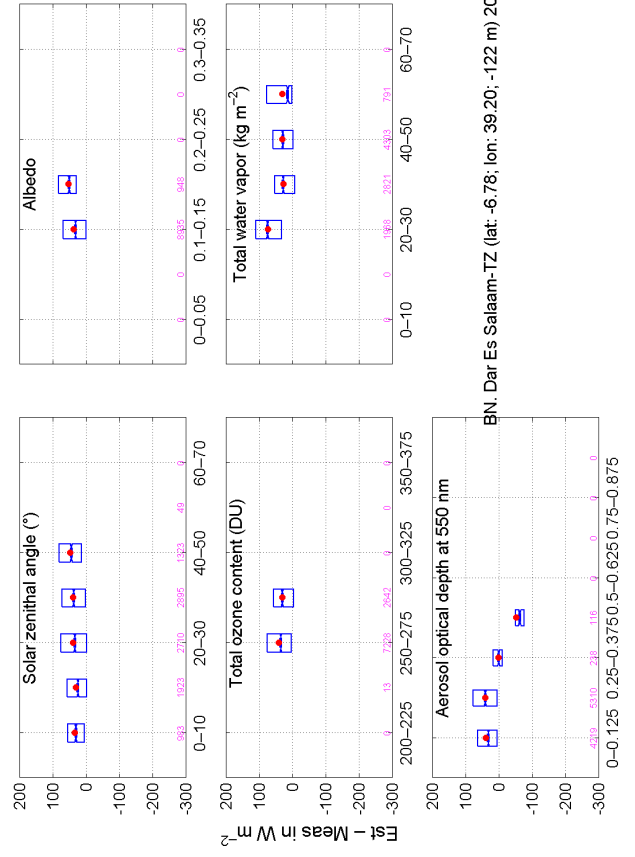
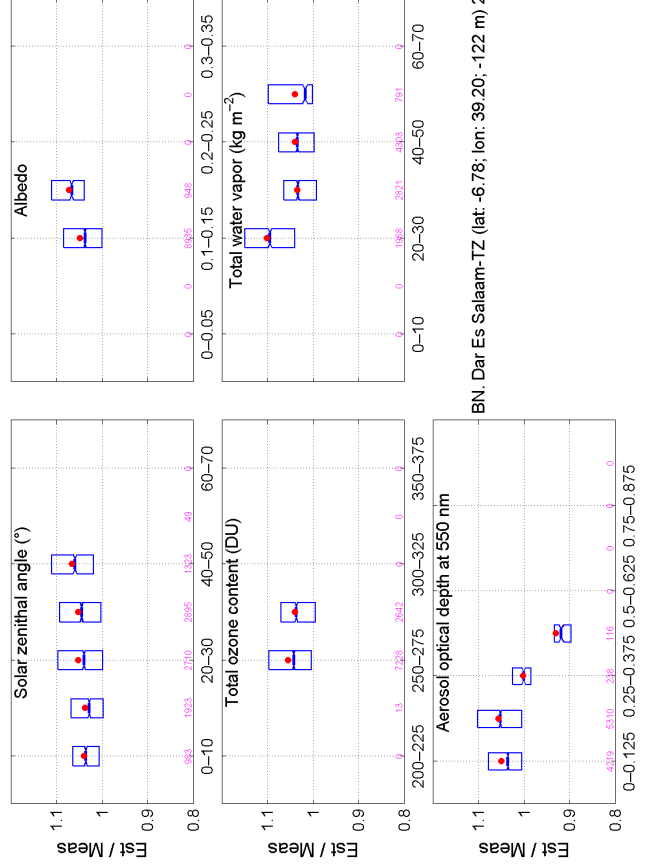
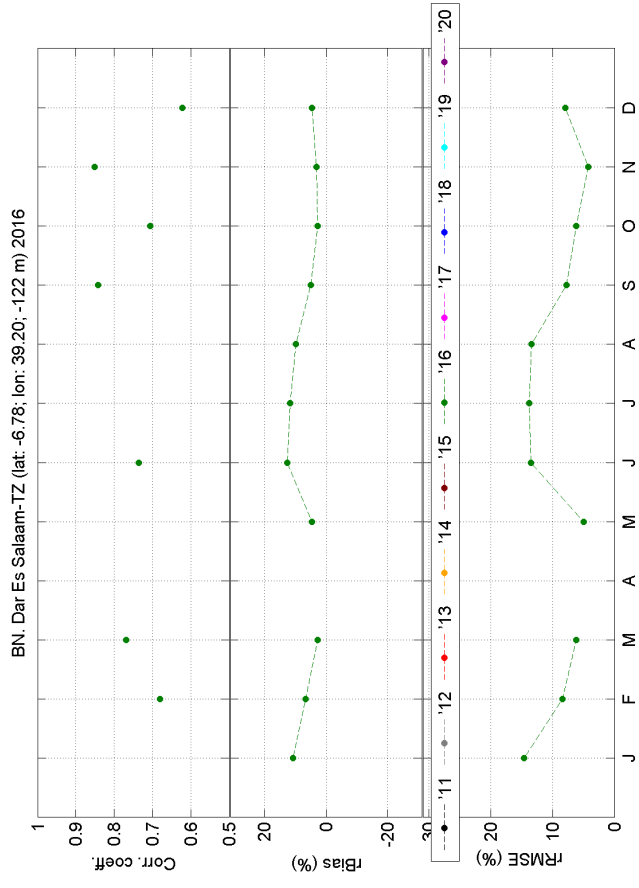
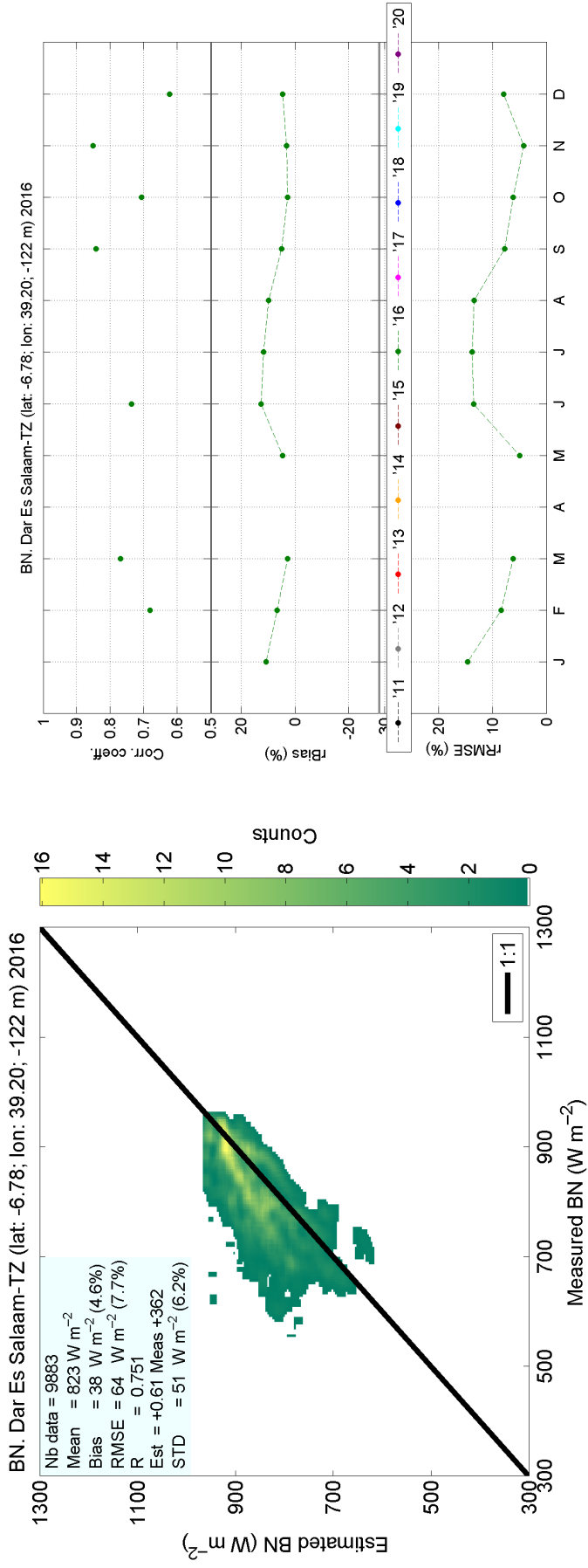


Figure S50: Comparison on direct component at normal irradiance at Dar Es Salaam-TZ

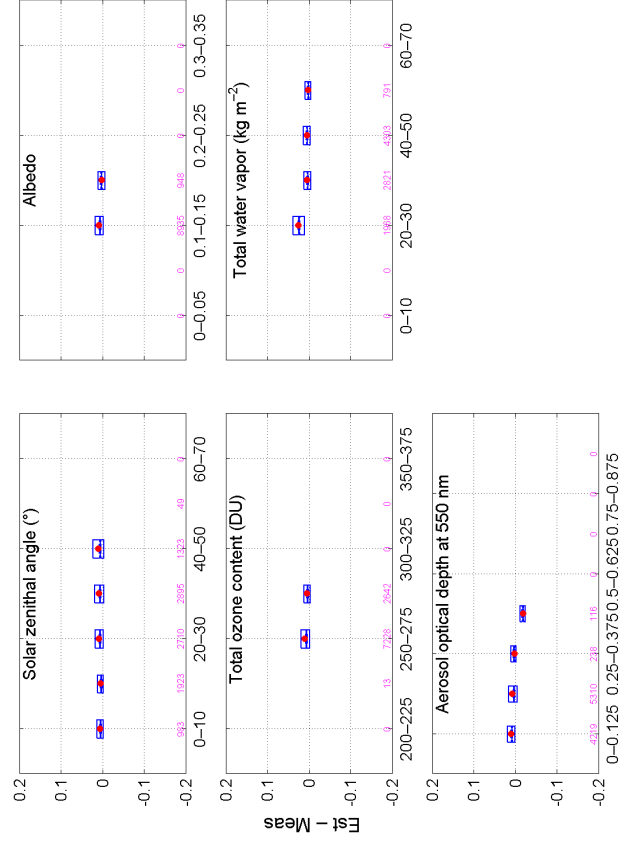
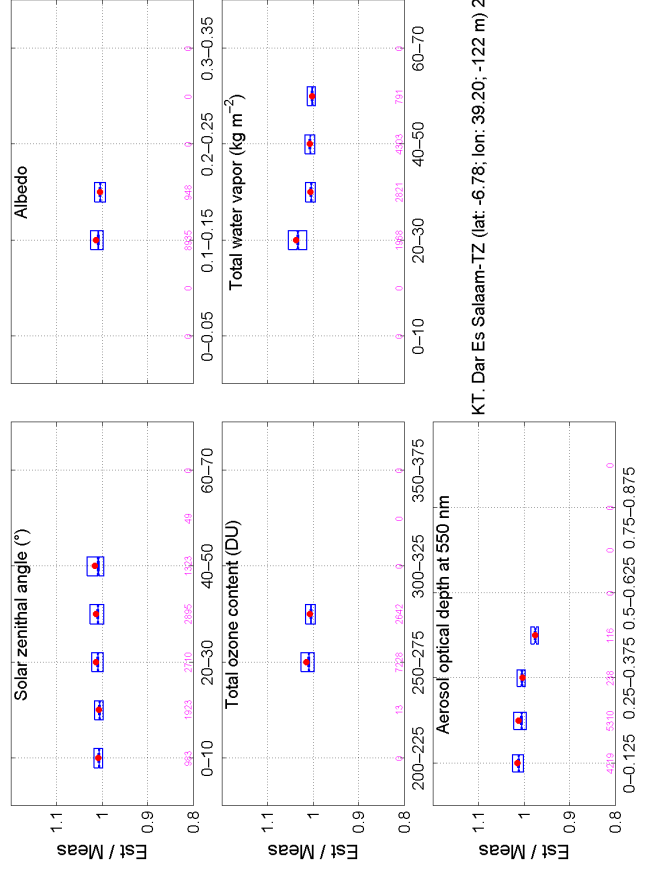
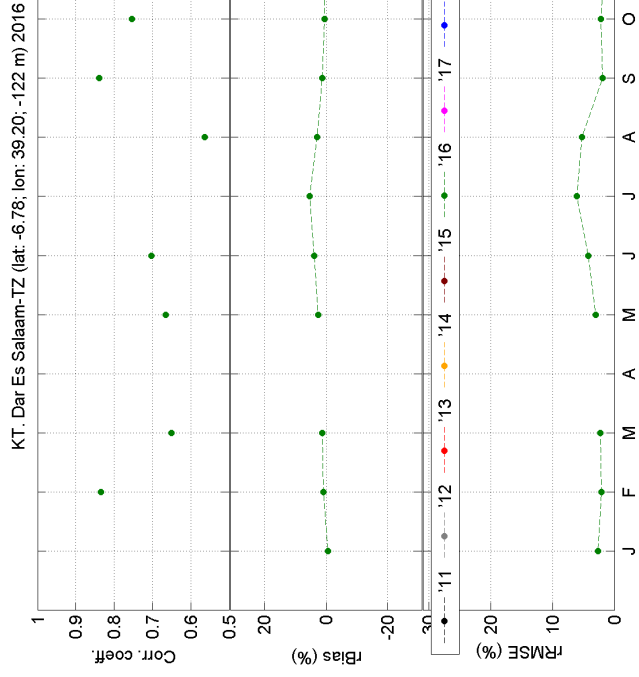
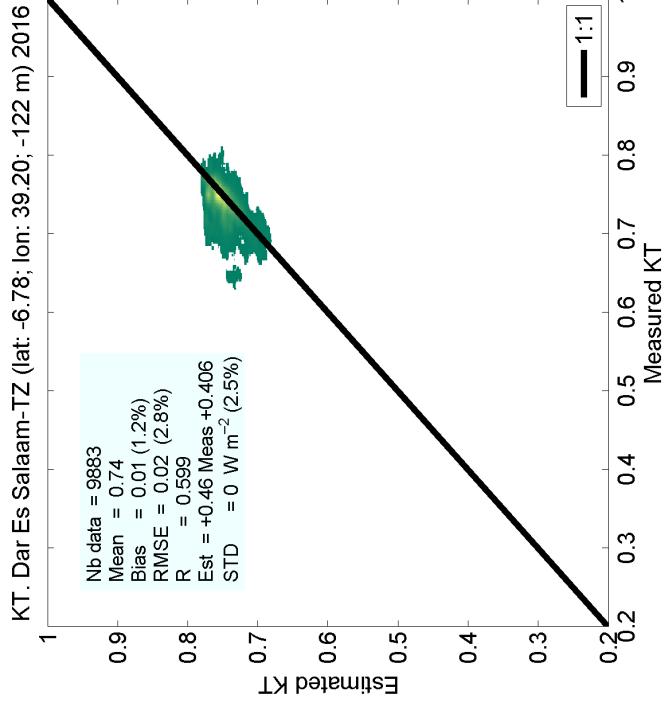


Figure S51: Comparison on clearness index at Dar Es Salaam-TZ

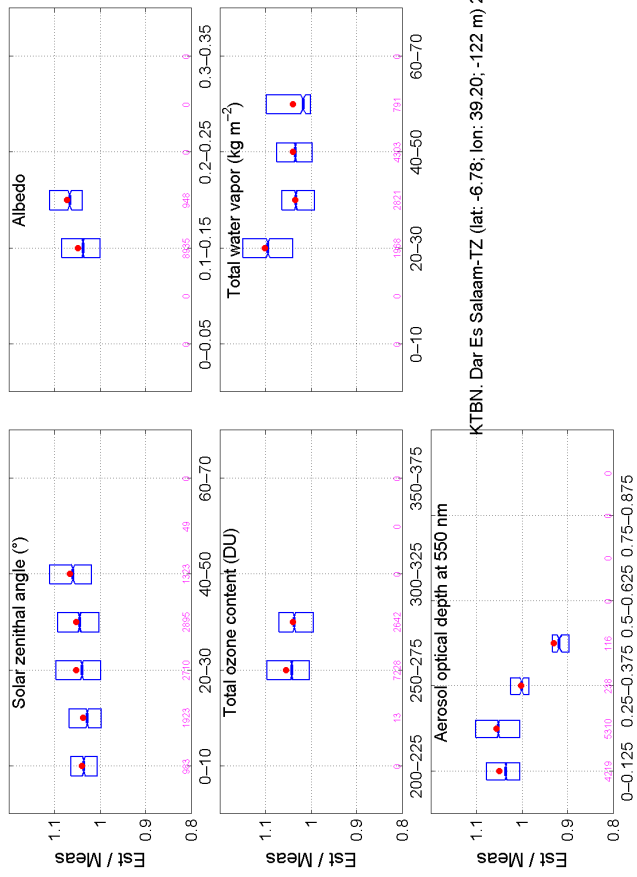
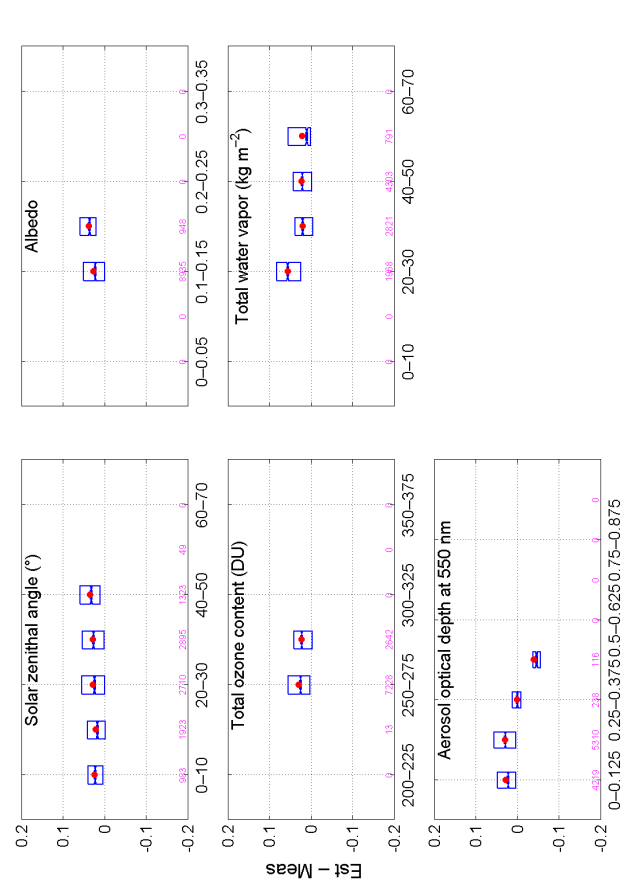
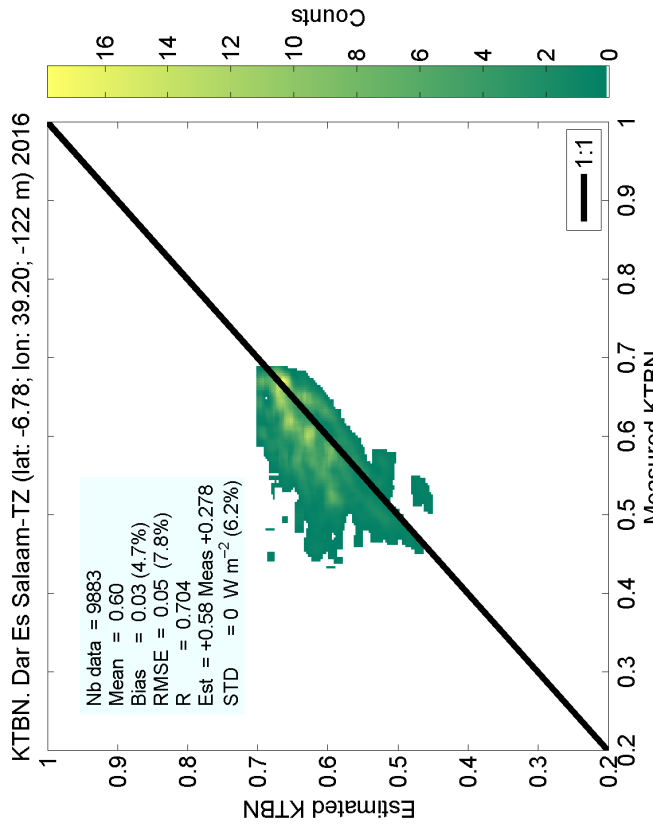
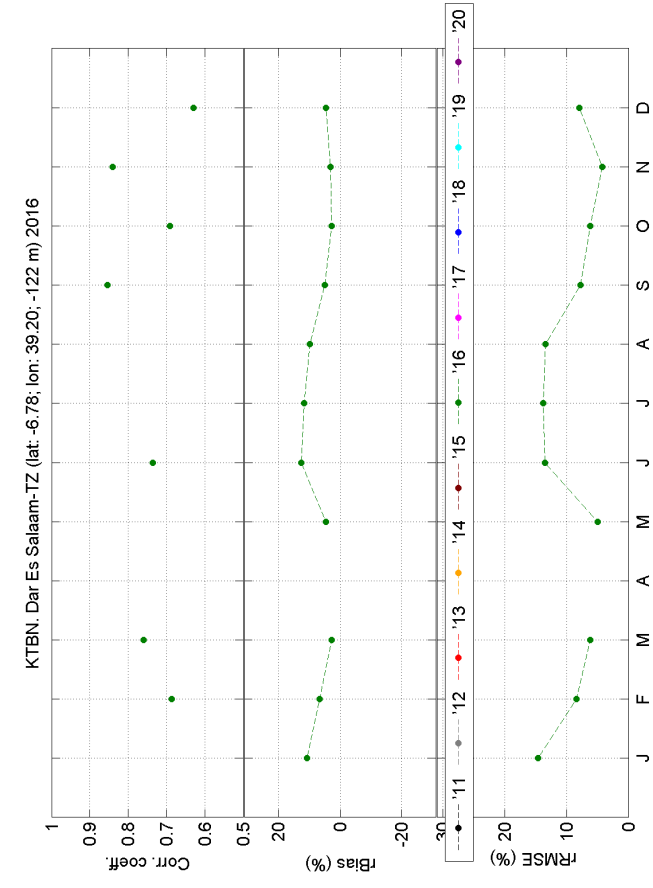


Figure S52: Comparison on direct clearness index at Dar Es Salaam-TZ

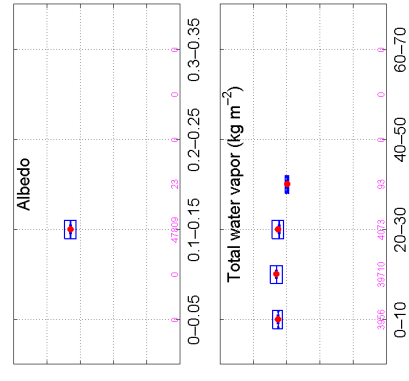
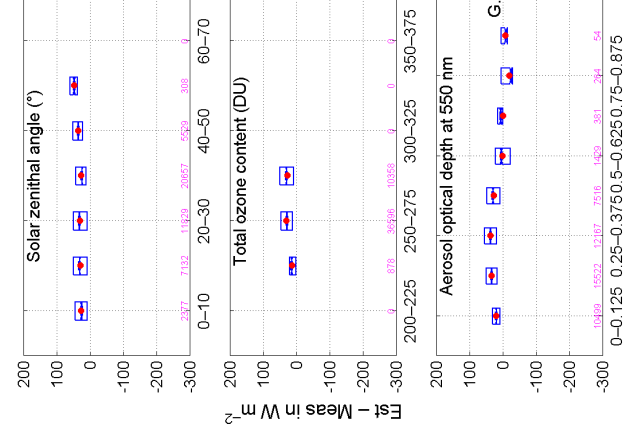
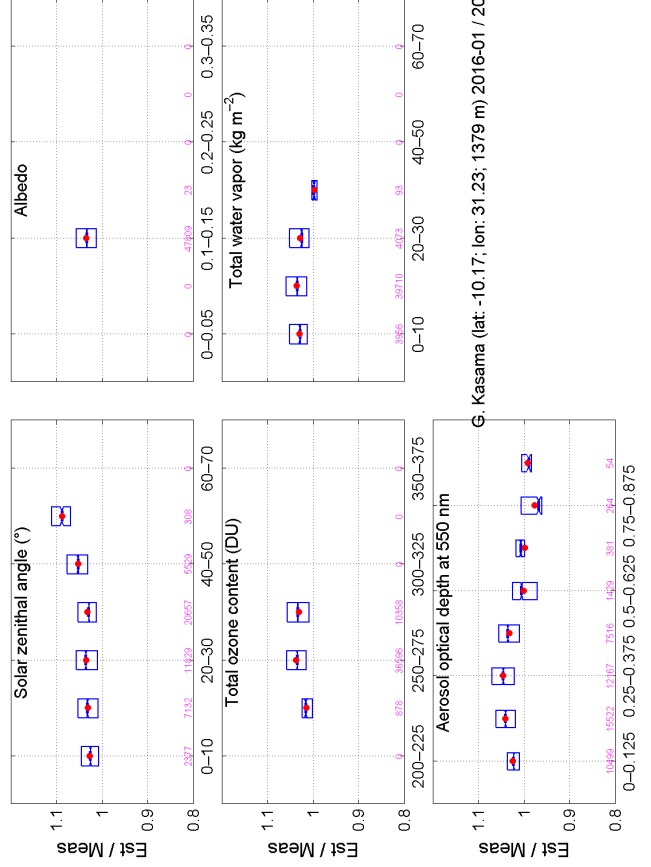
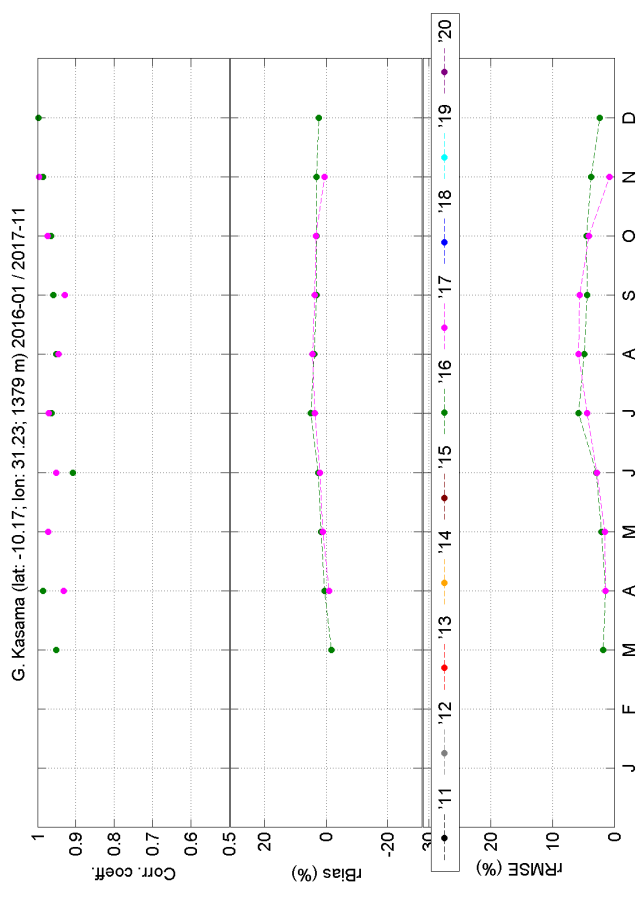
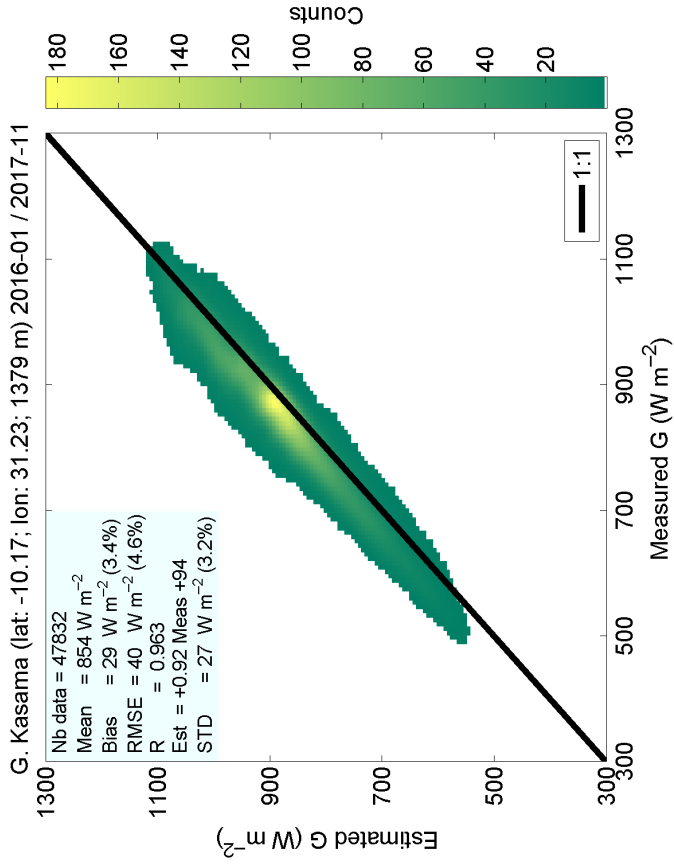


Figure S53: Comparison on global irradiance at Kasama

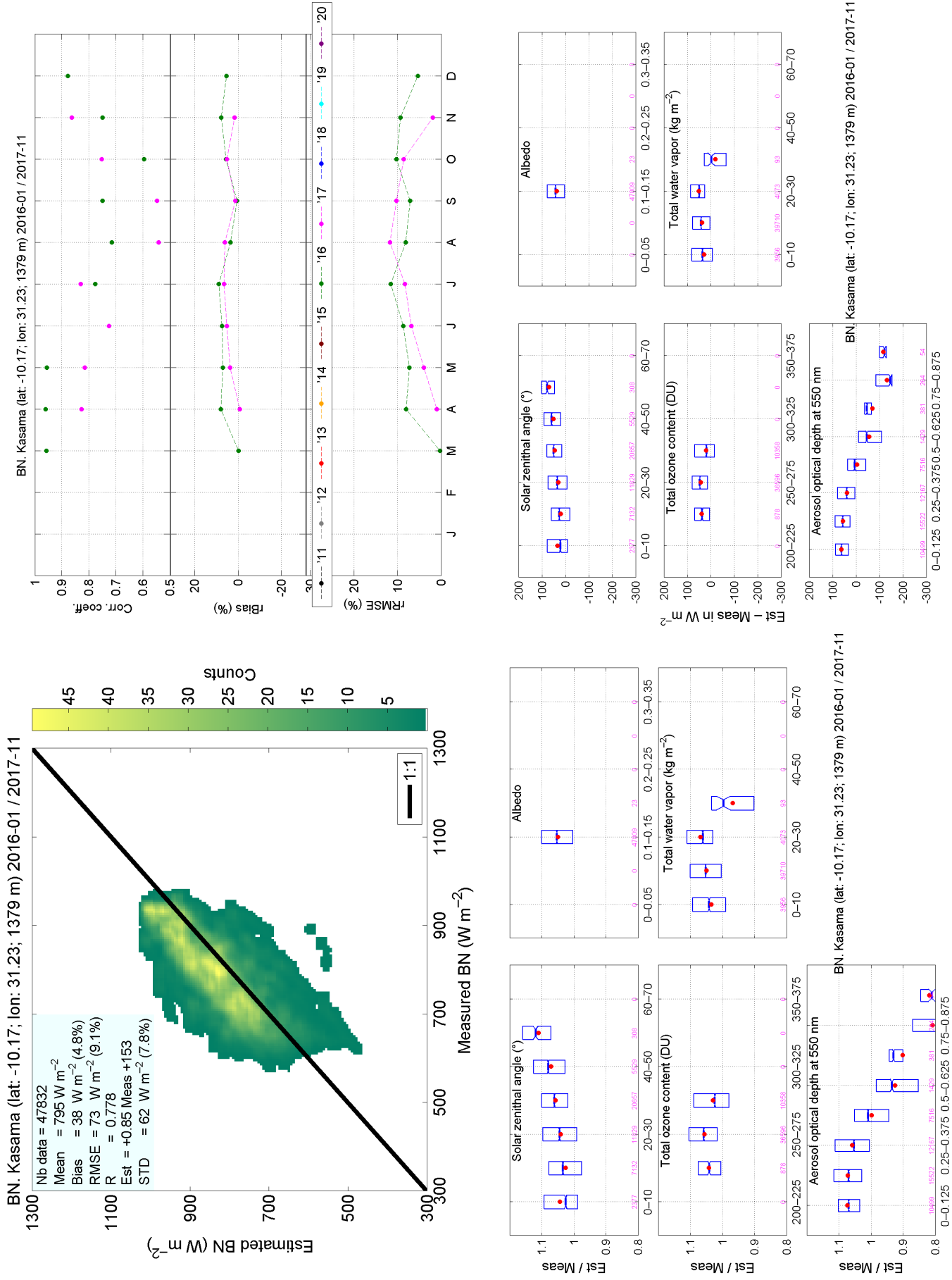


Figure S54: Comparison on direct component at normal irradiance at Kasama

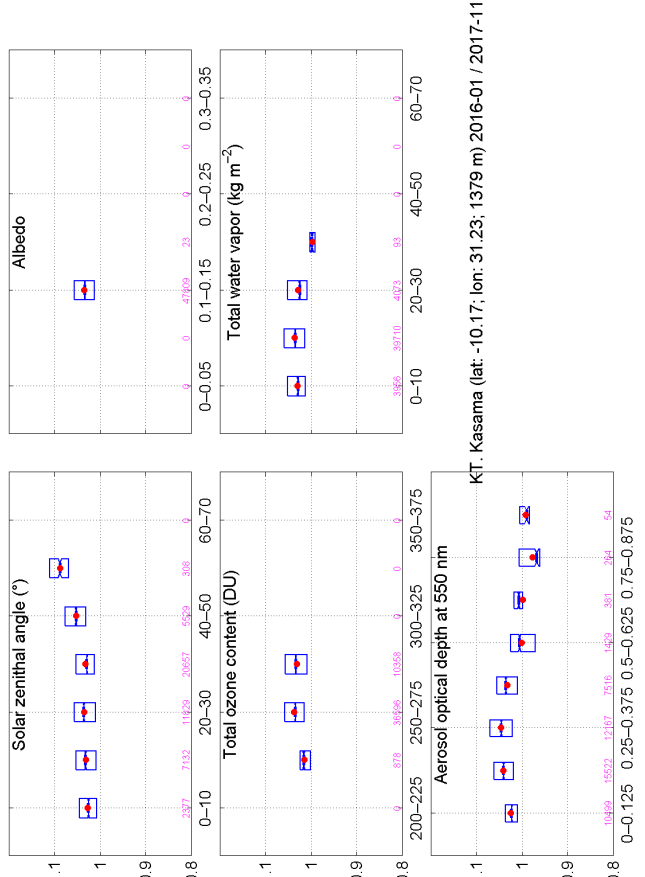
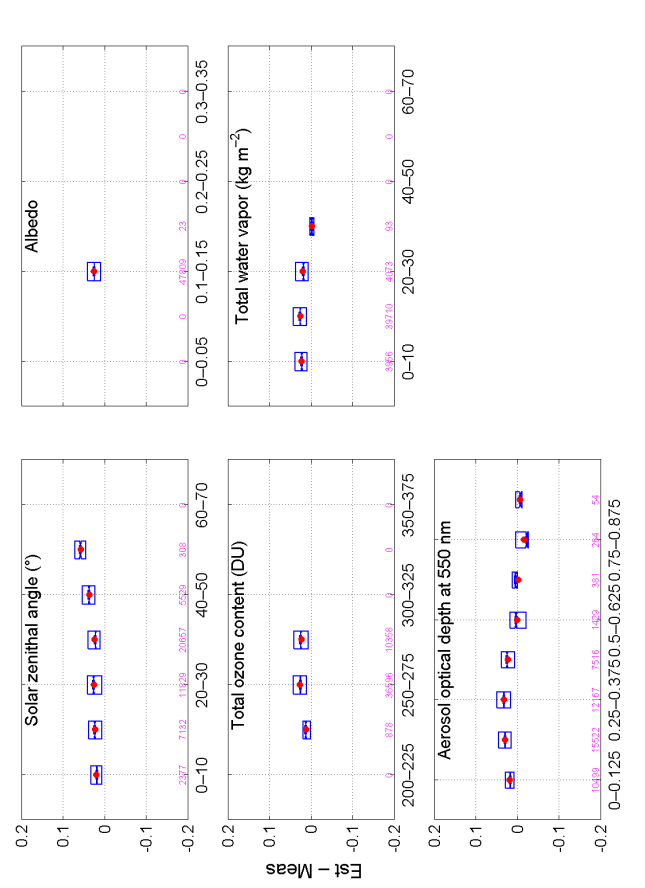
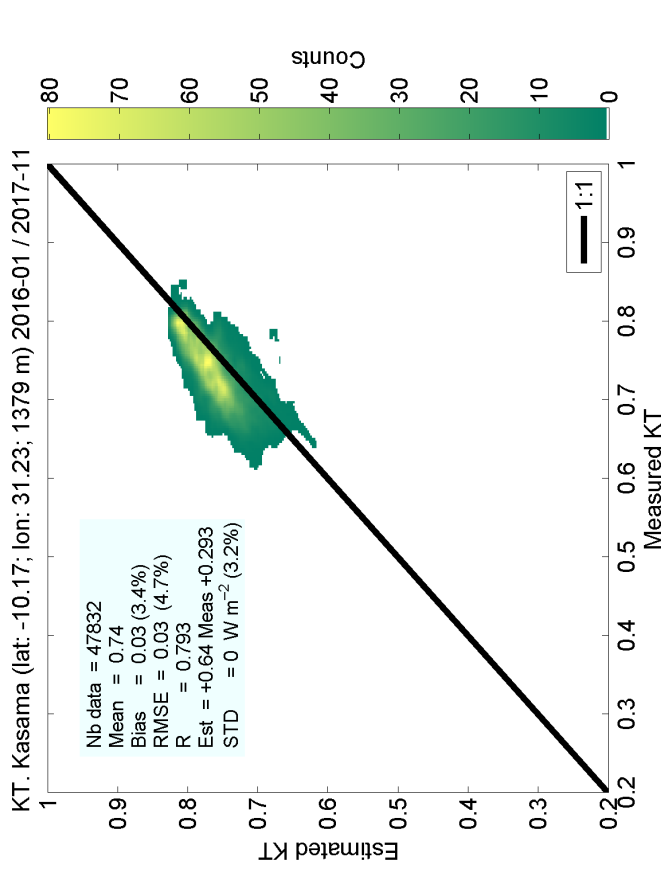
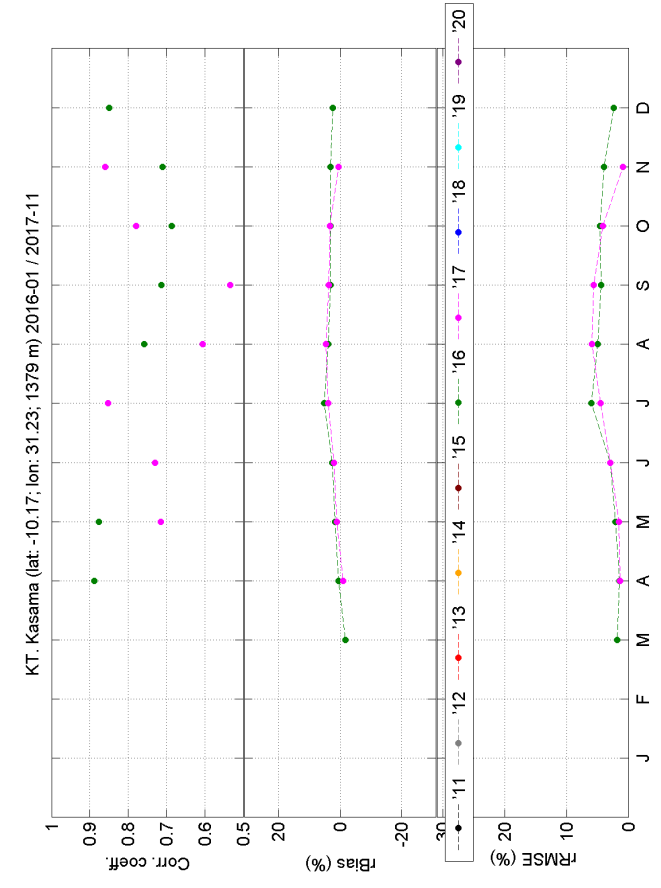


Figure S55: Comparison on clearness index at Kasama

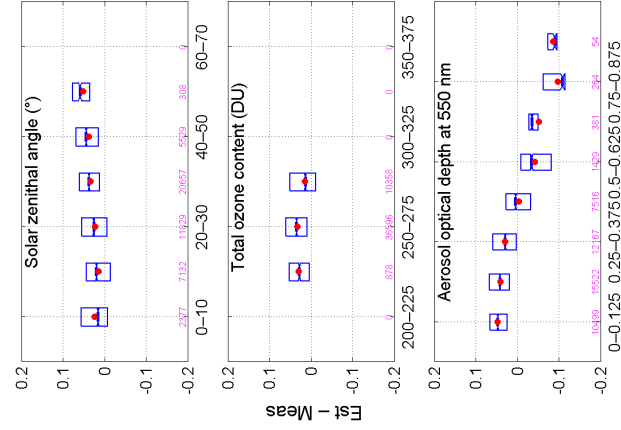
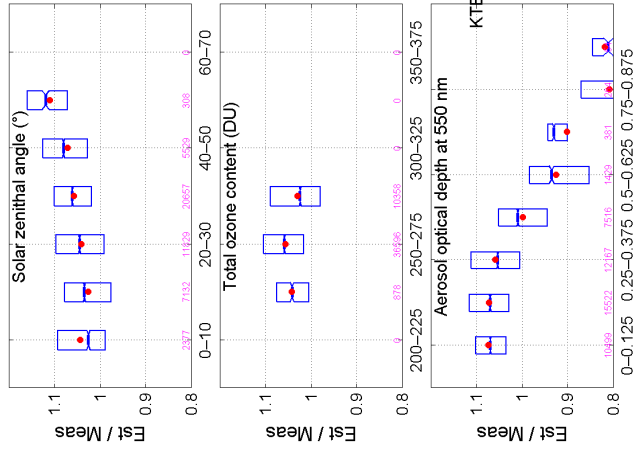
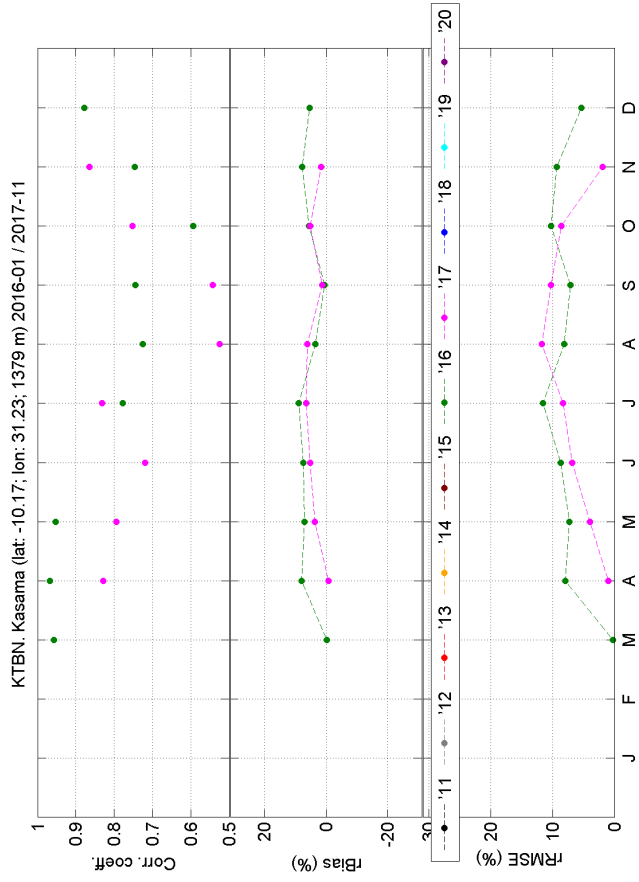
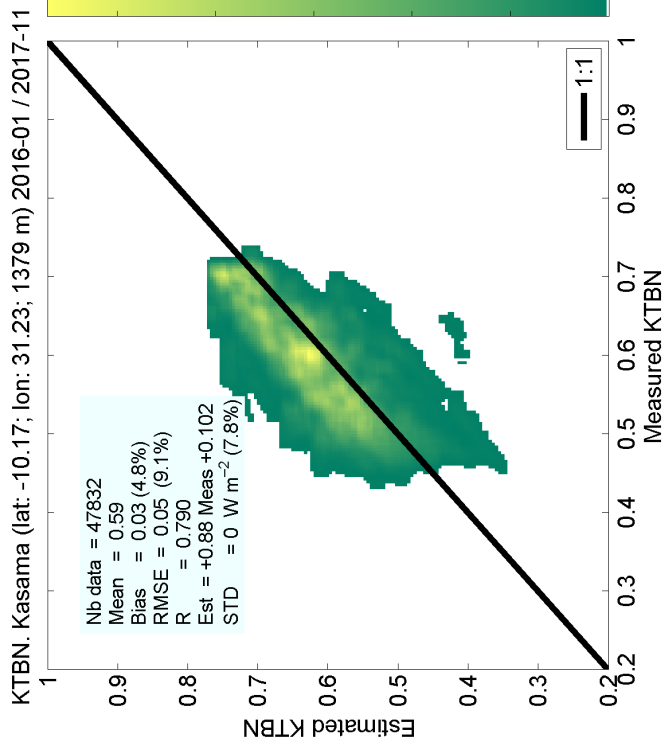


Figure S56: Comparison on direct clearness index at Kasama

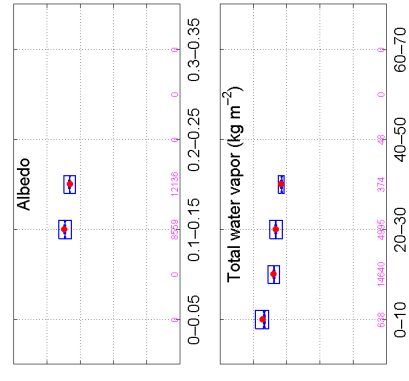
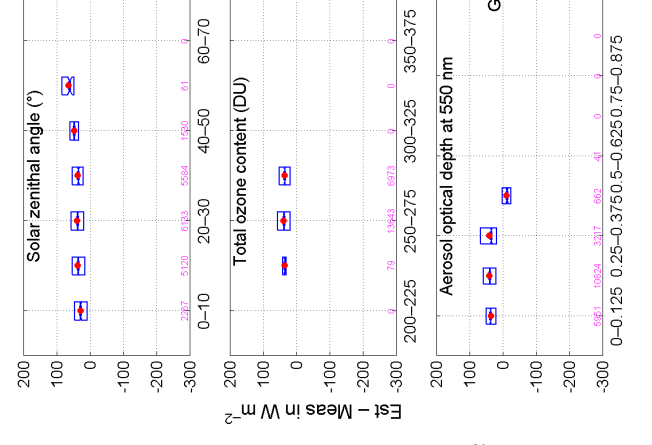
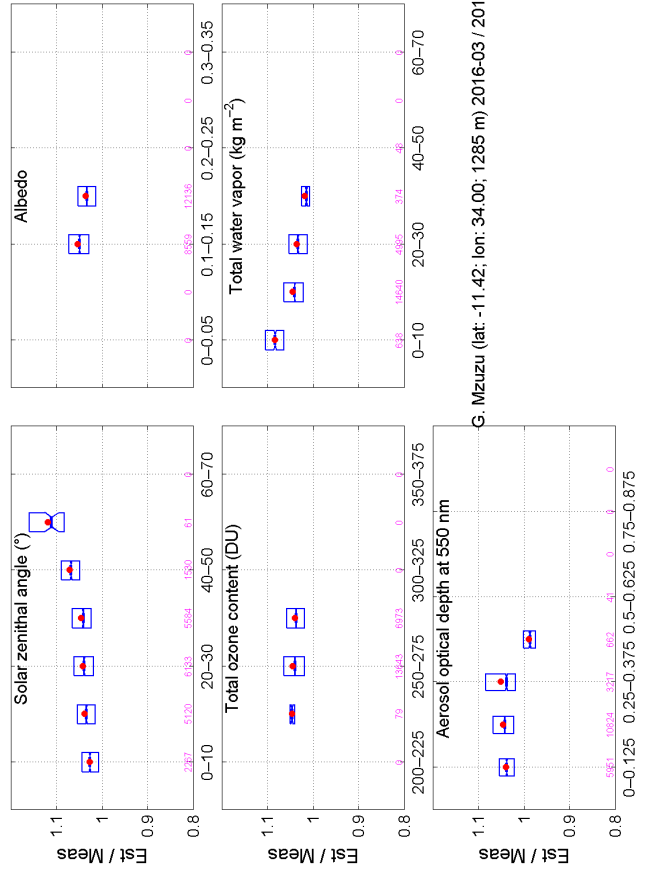
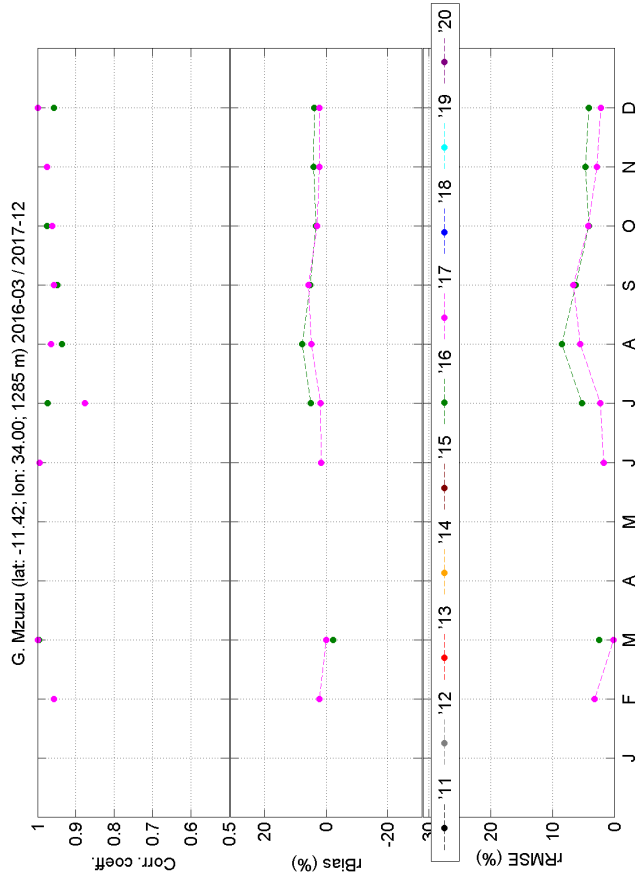
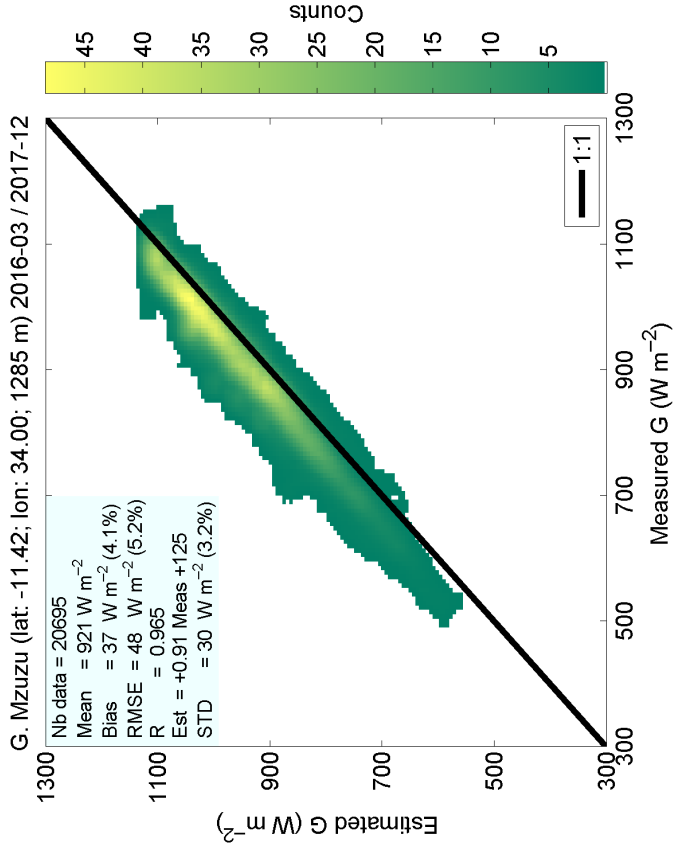


Figure S57: Comparison on global irradiance at Mizuzu

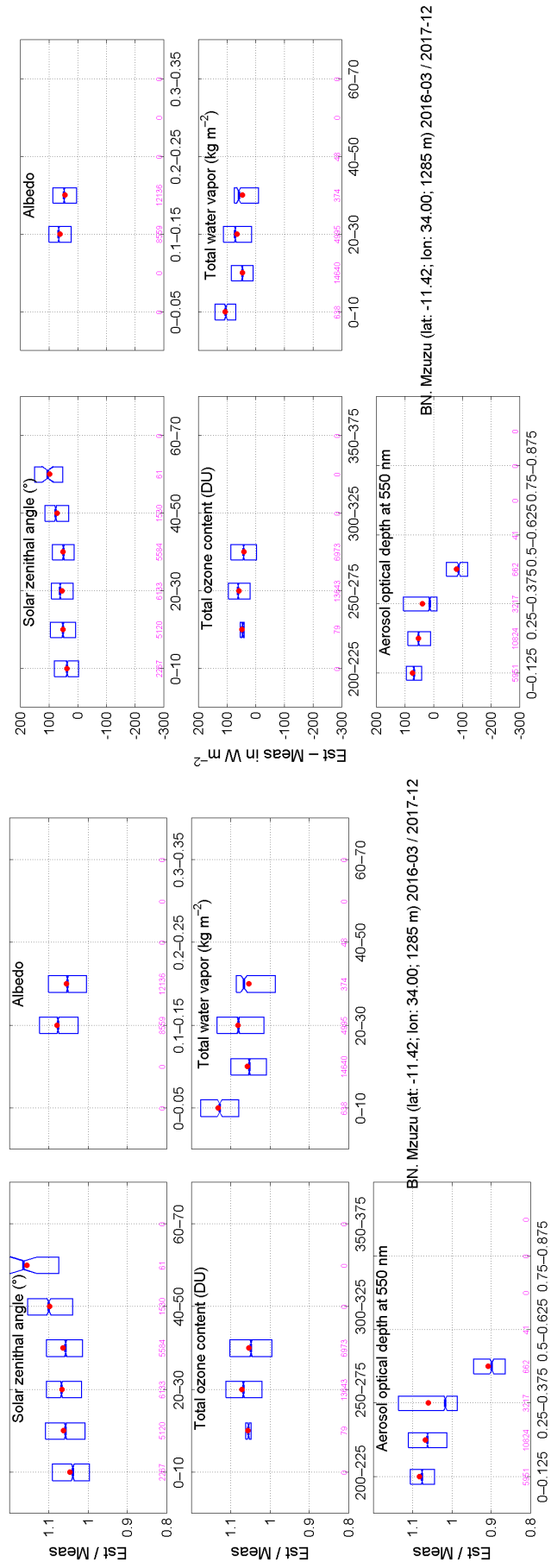
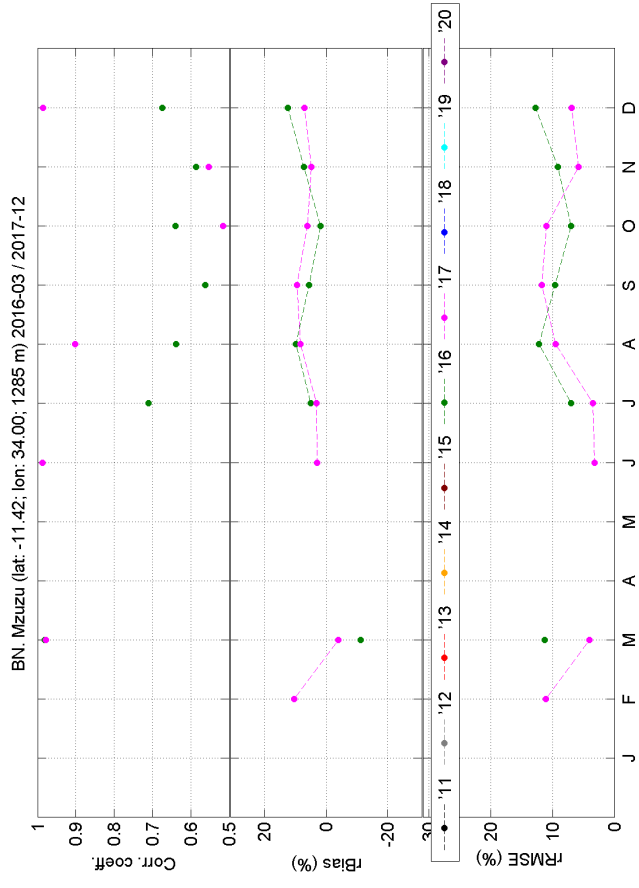
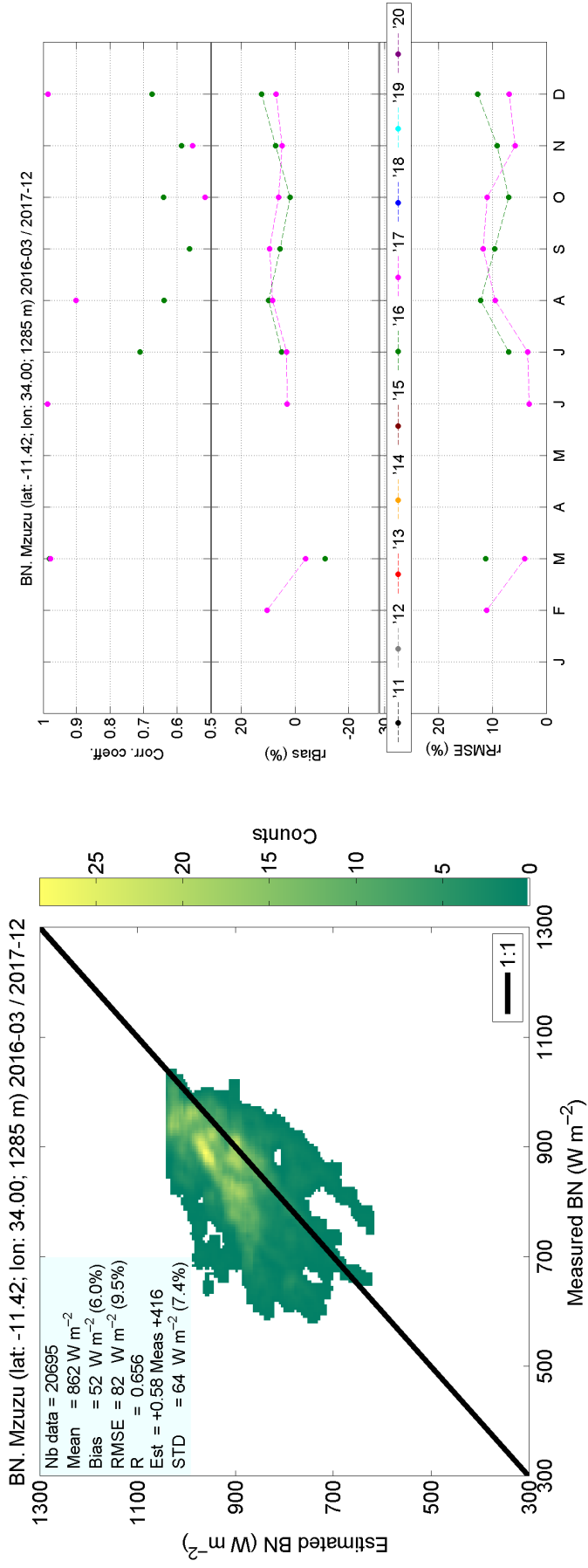
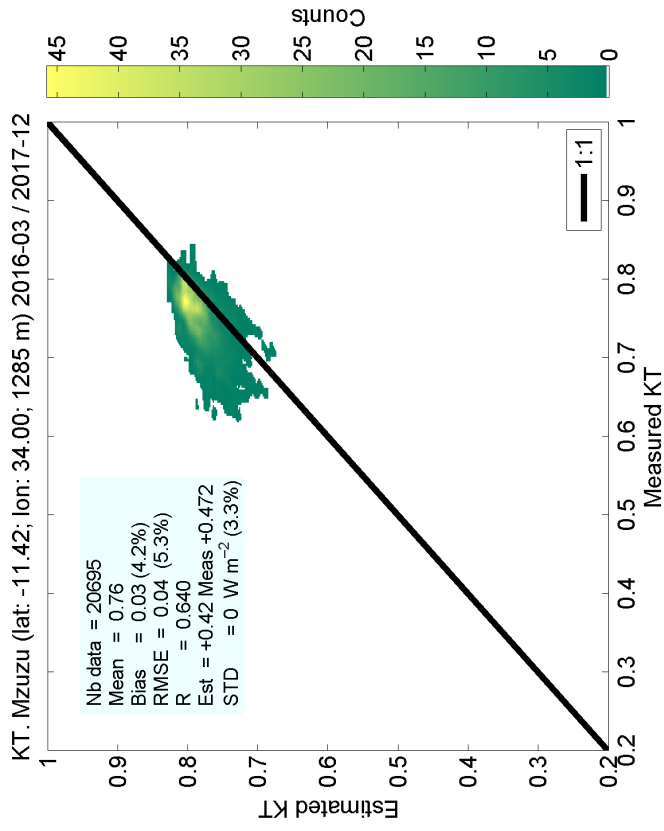
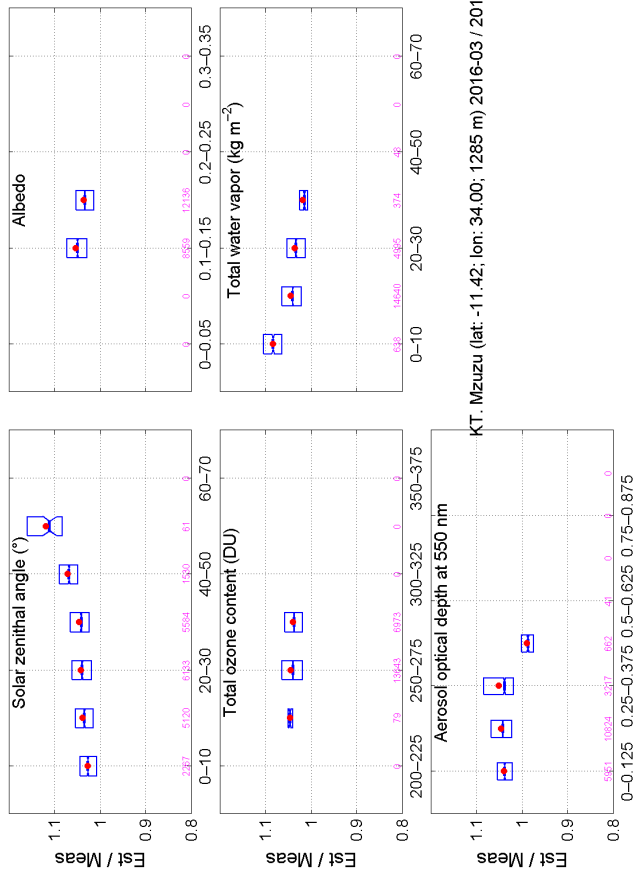
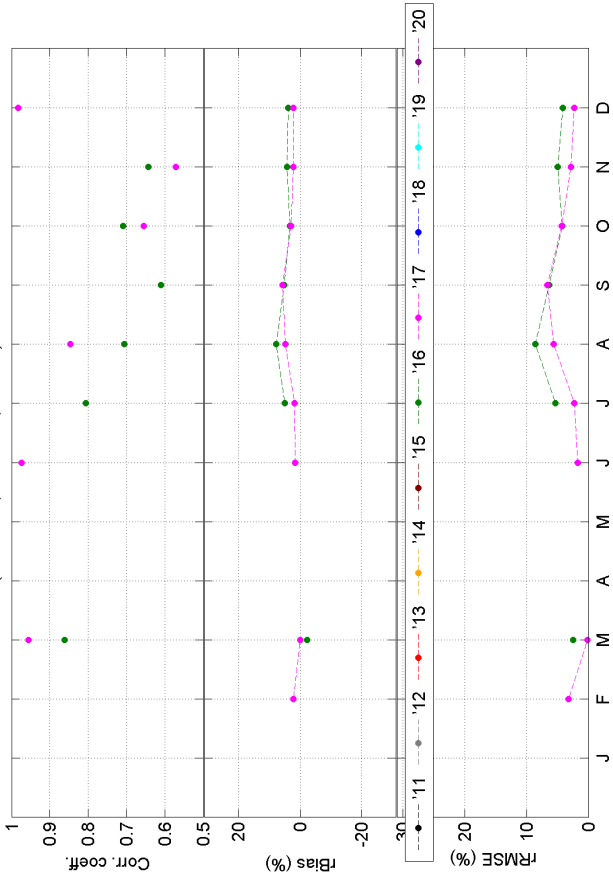


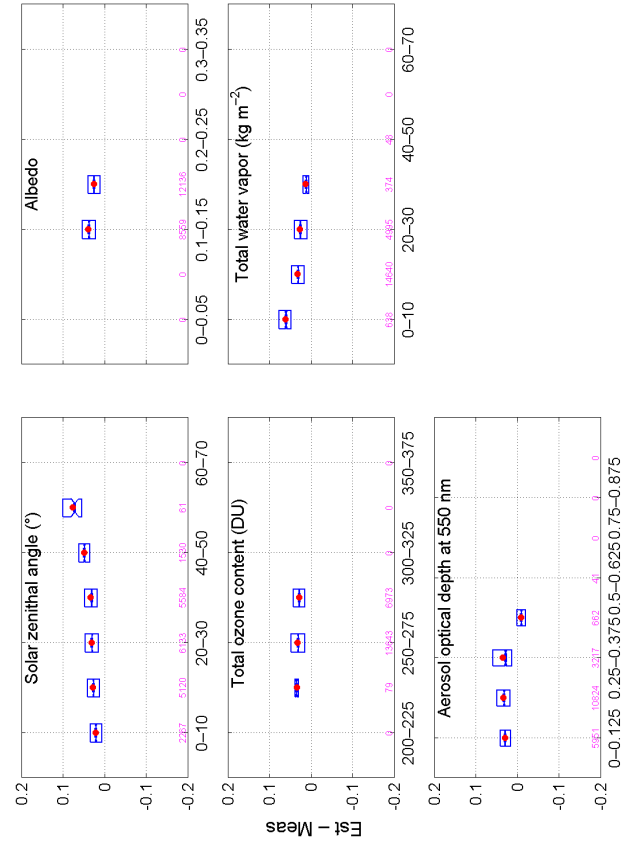
Figure S58: Comparison on direct component at normal irradiance at Mzuzu

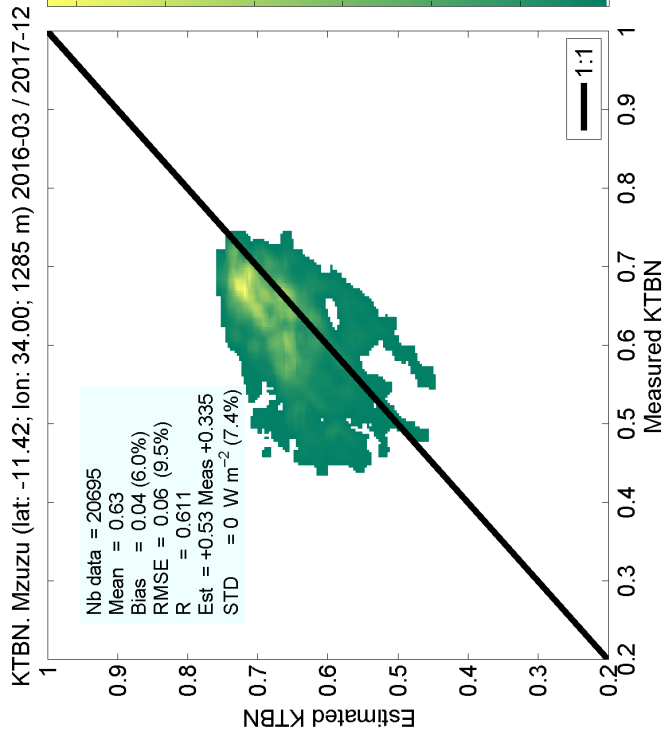


KT. Mzuzu (lat: -11.42; lon: 34.00; 1285 m) 2016-03 / 2017-12



KT. Mzuzu (lat: -11.42; lon: 34.00; 1285 m) 2016-03 / 2017-12





KTBN, Mzuzu (lat: -11.42; lon: 34.00; 1285 m) 2016-03 / 2017-12

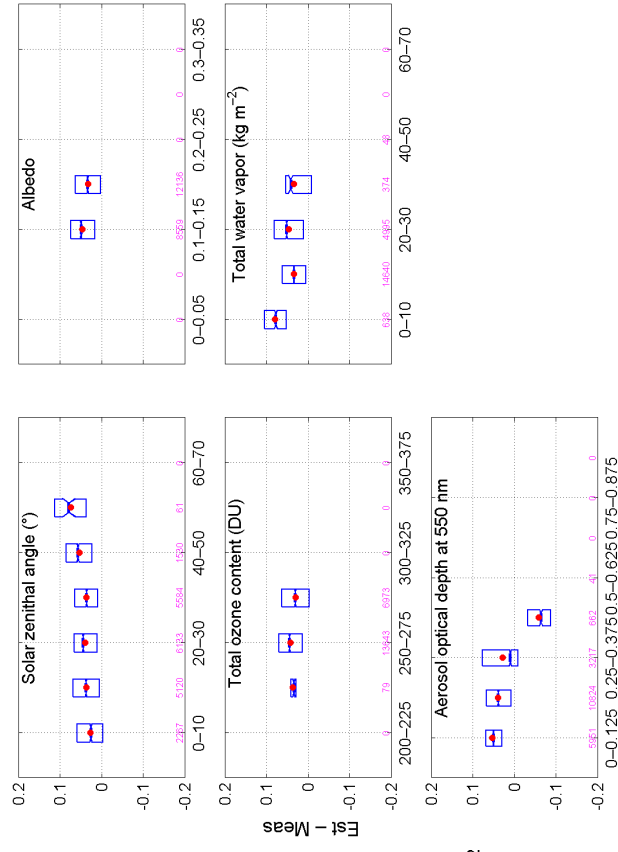
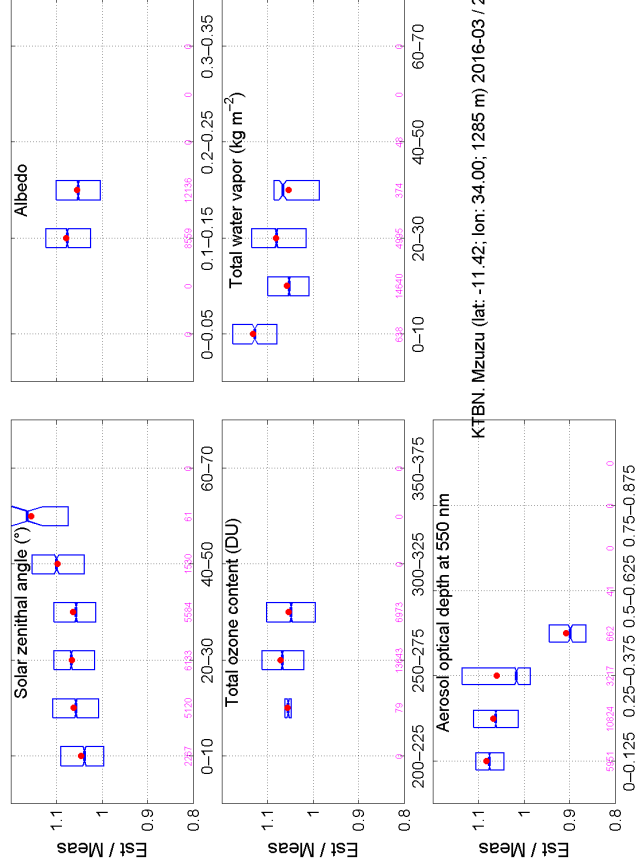
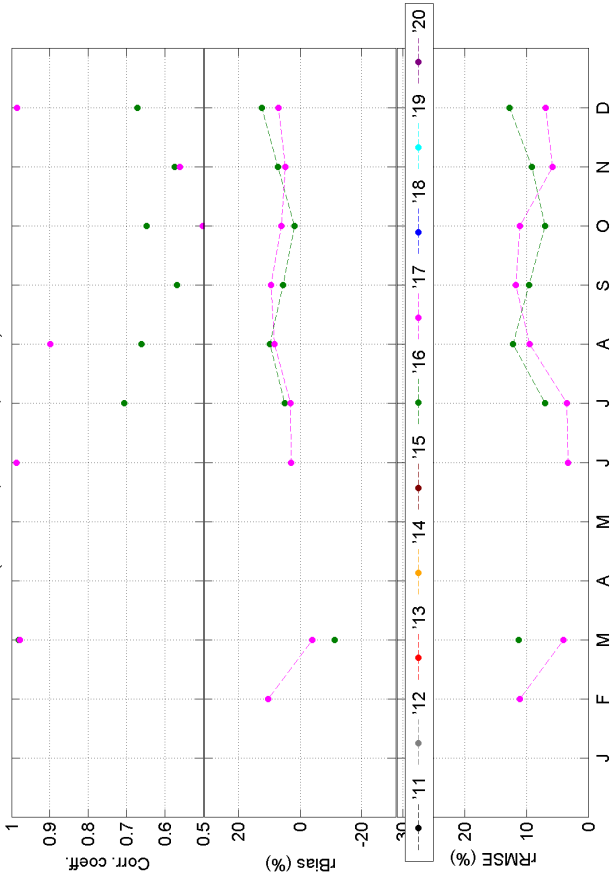


Figure S60: Comparison on direct clearness index at Mzuzu

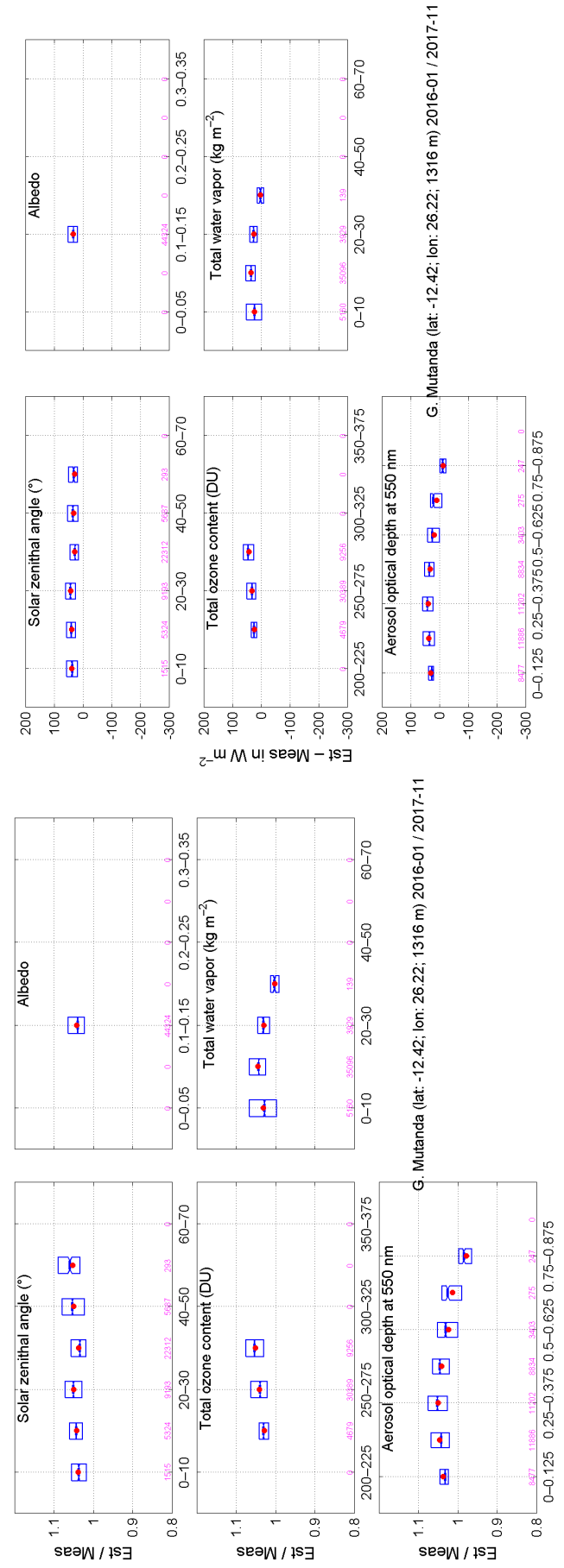
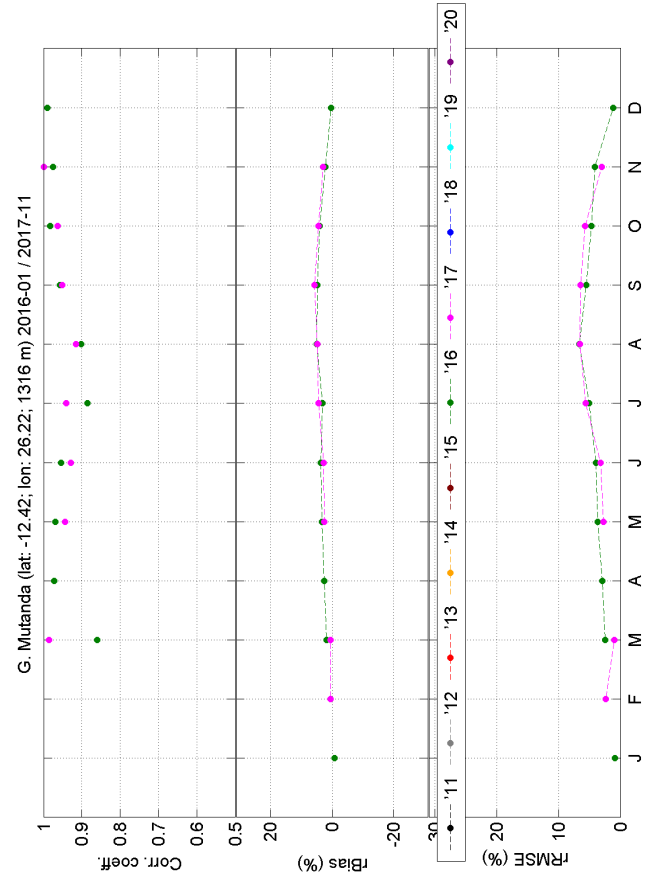
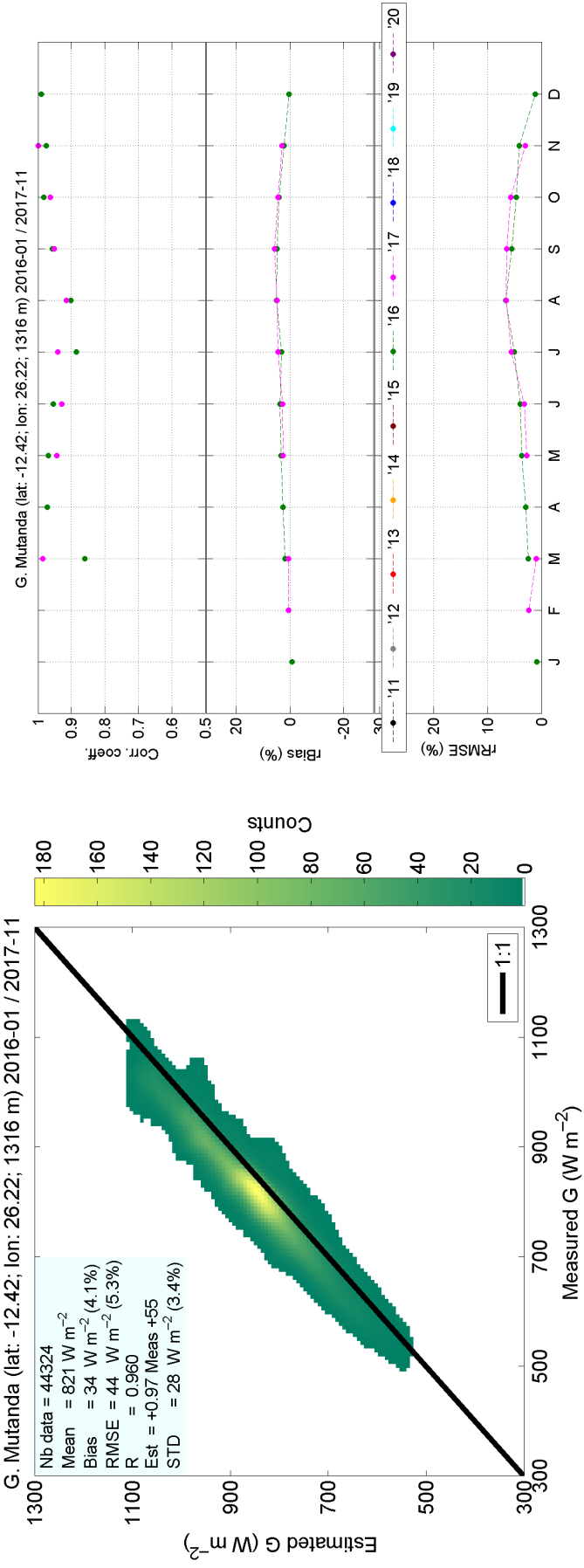


Figure S61: Comparison on global irradiance at Mutanda

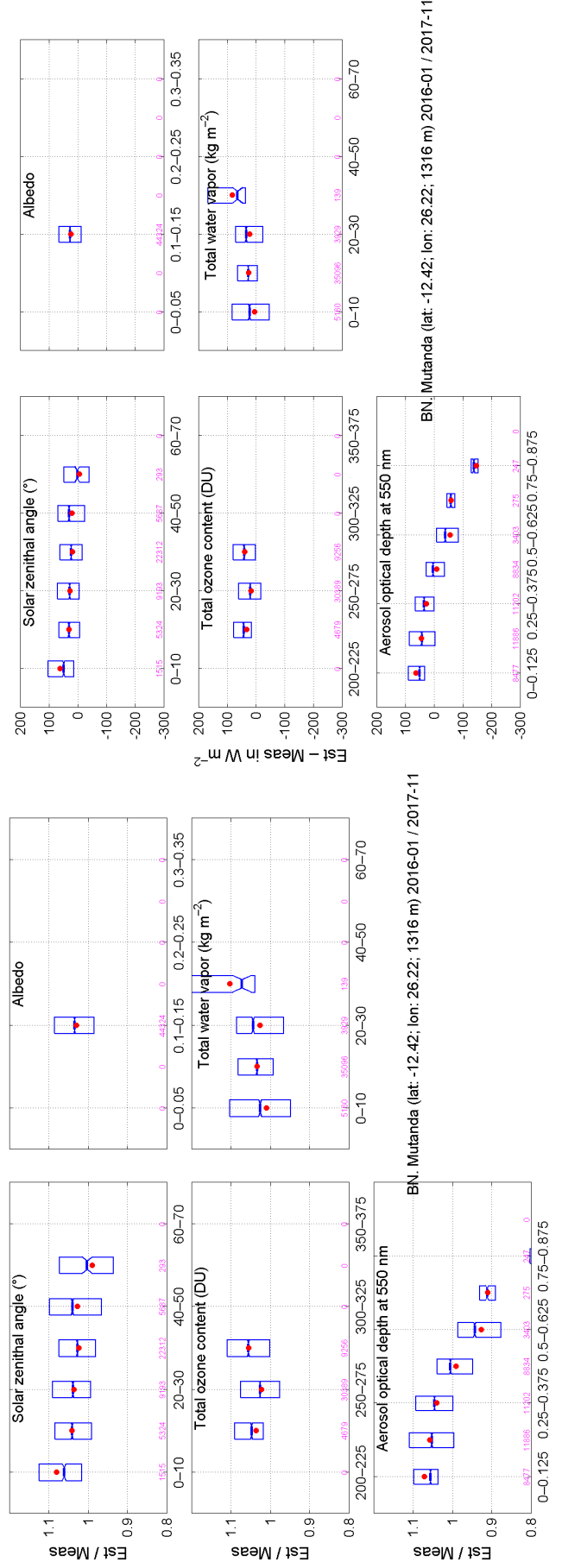
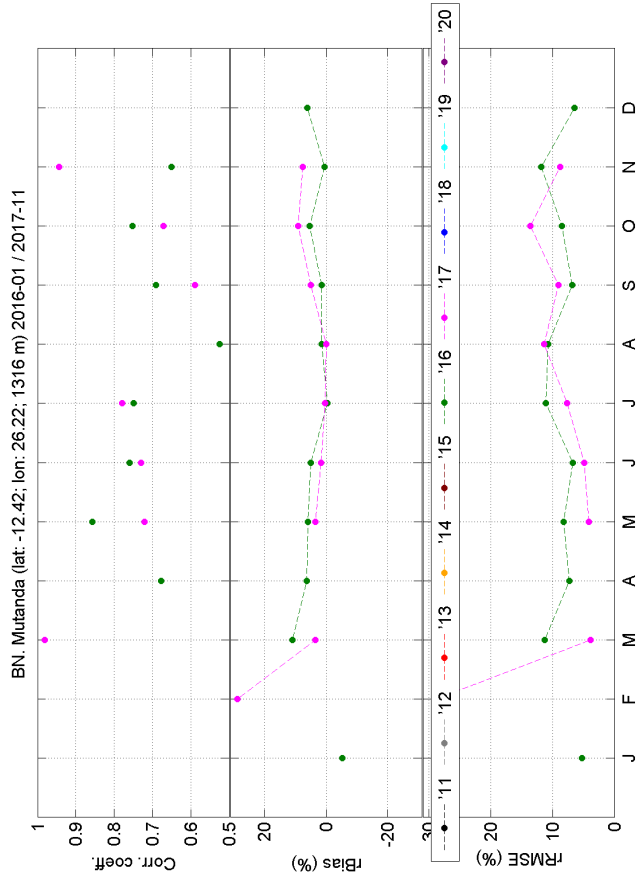
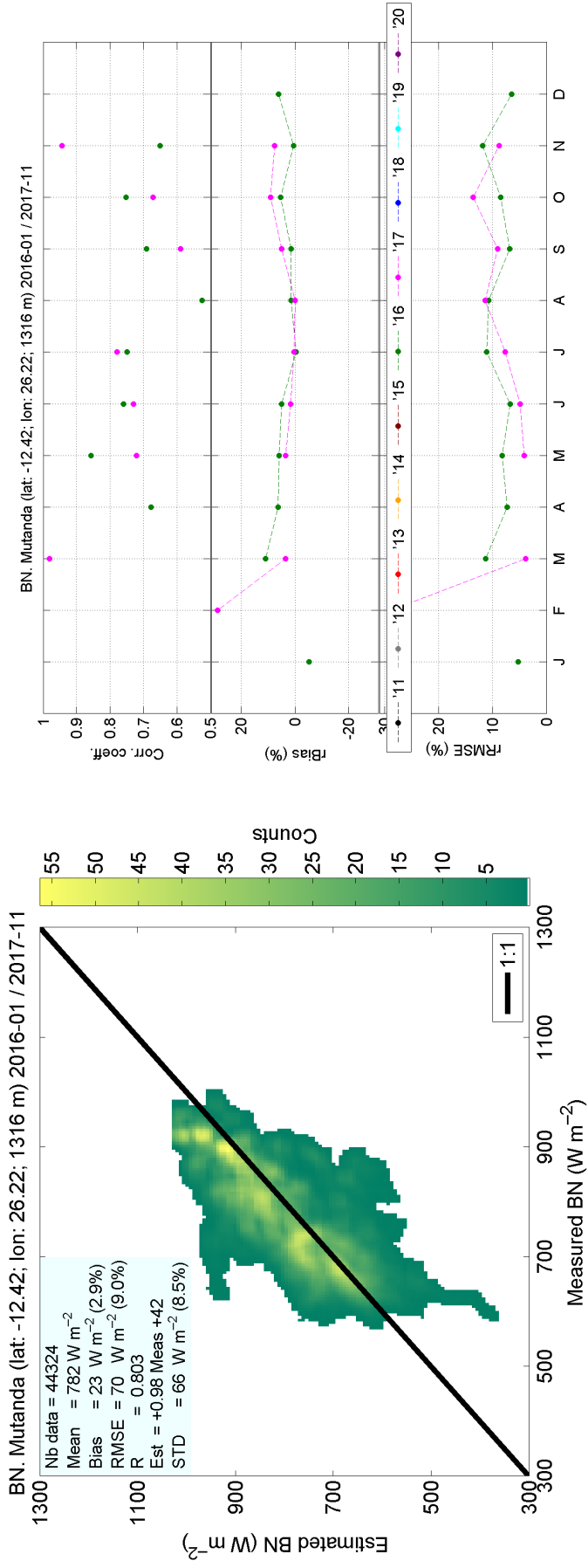


Figure S62: Comparison on direct component at normal irradiance at Mutanda

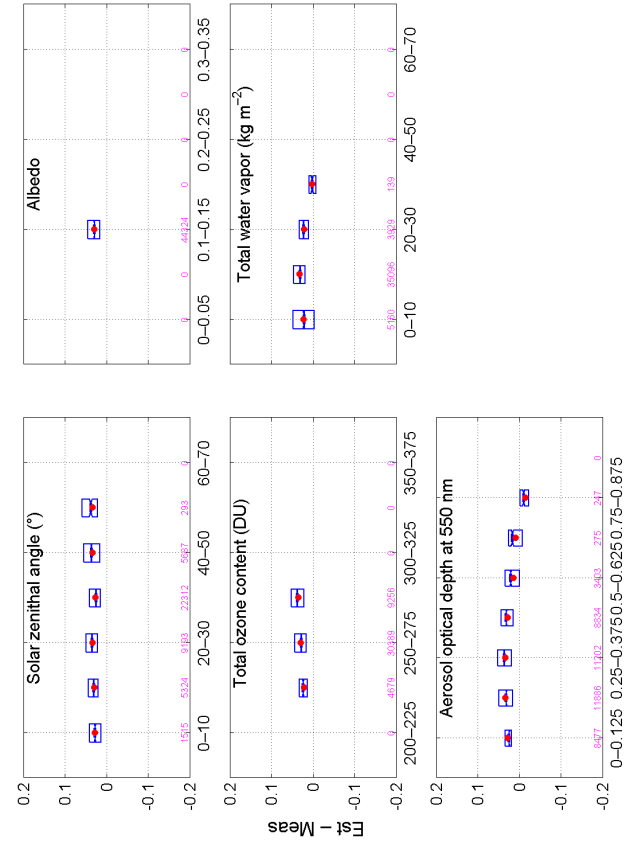
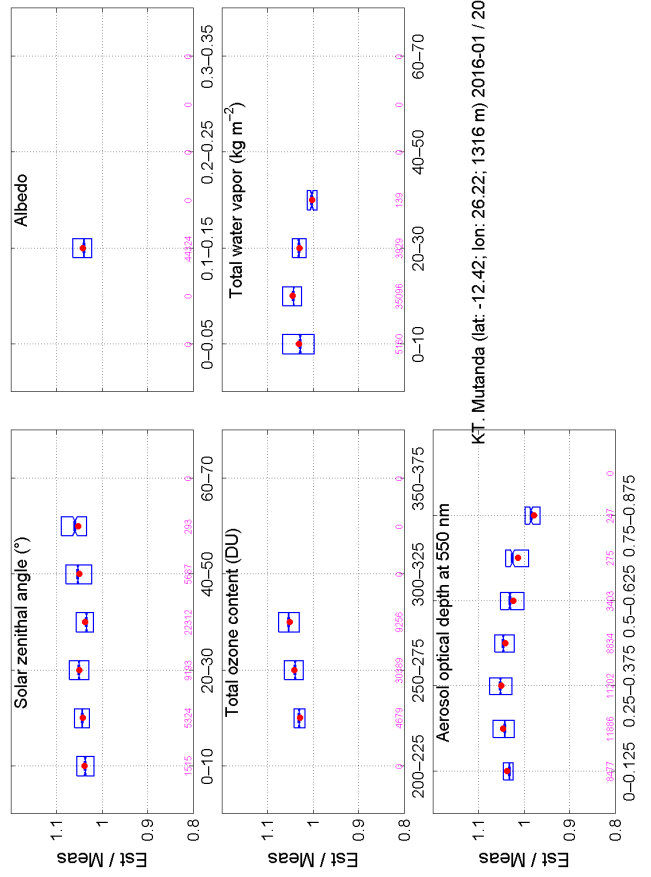
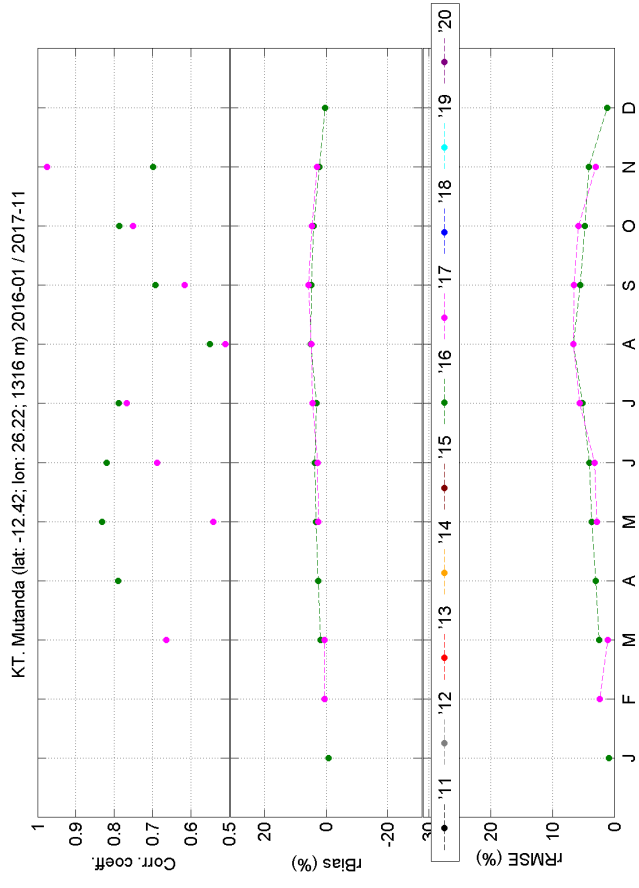
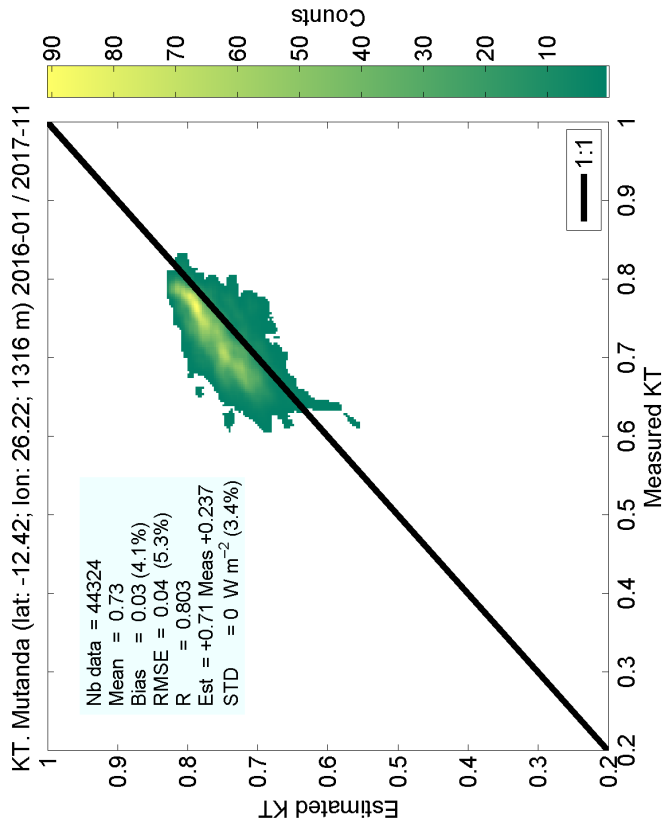


Figure S63: Comparison on clearness index at Mutanda

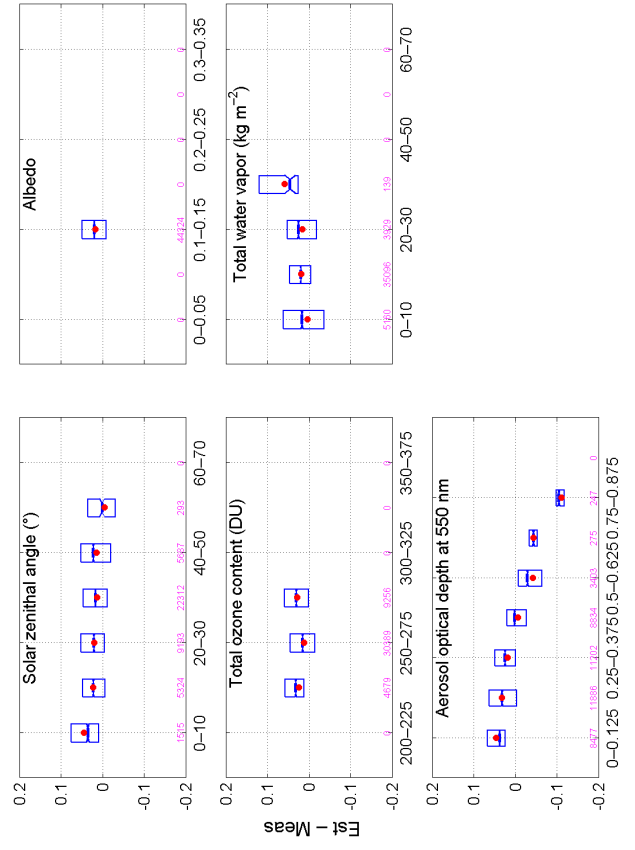
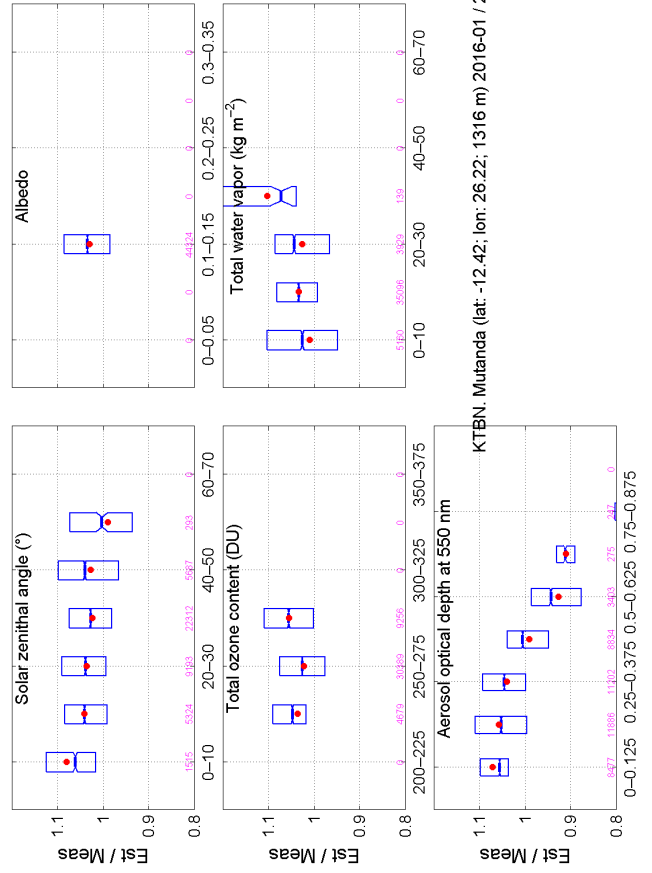
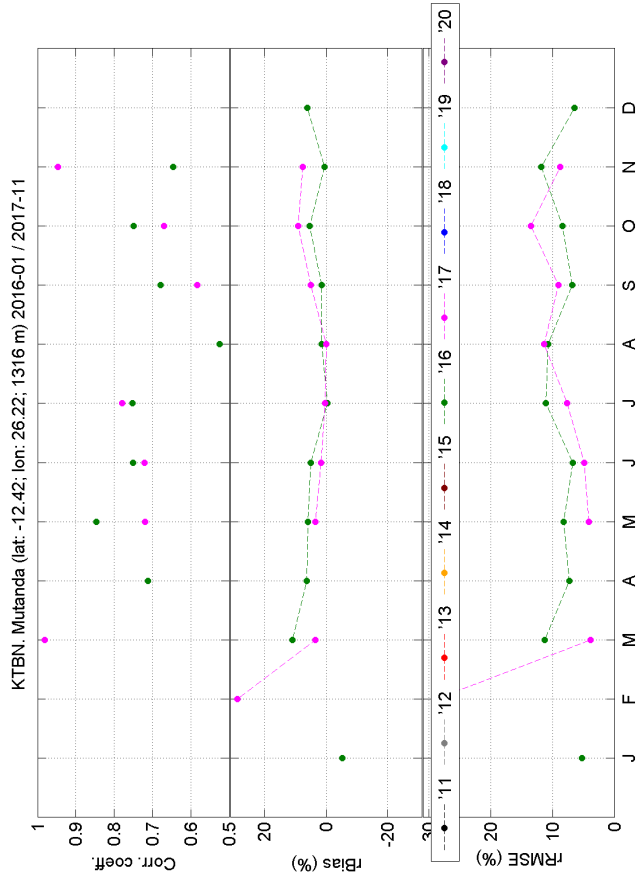
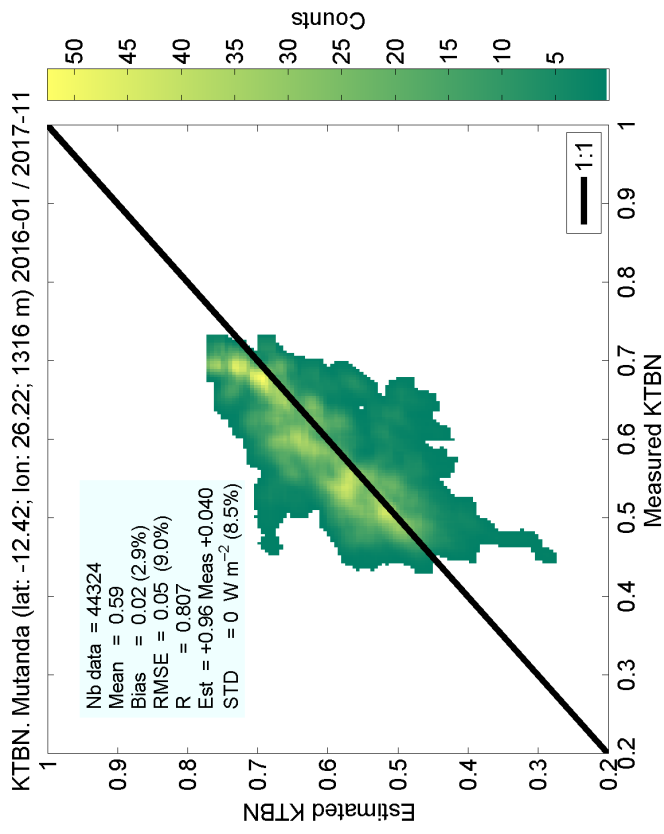


Figure S64: Comparison on direct clearness index at Mutanda

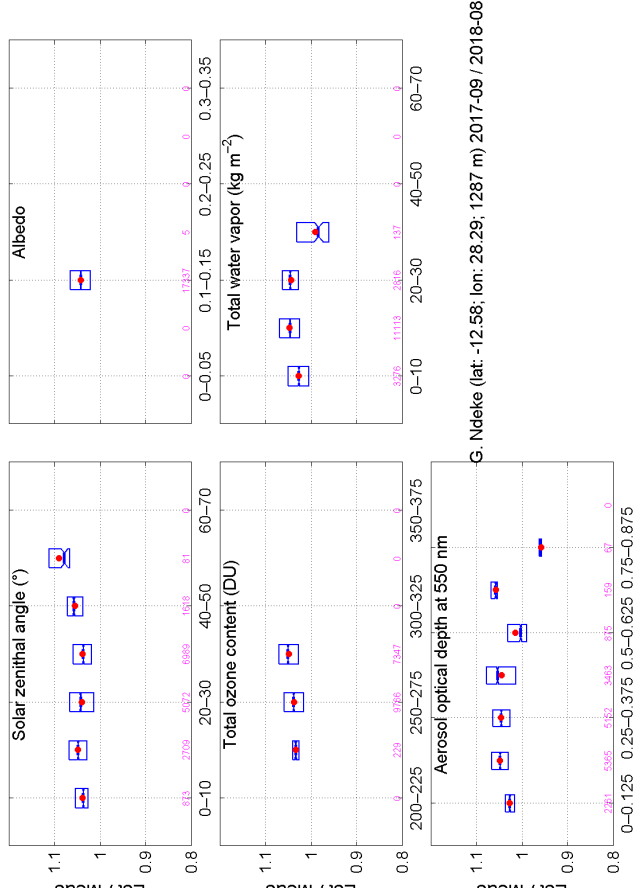
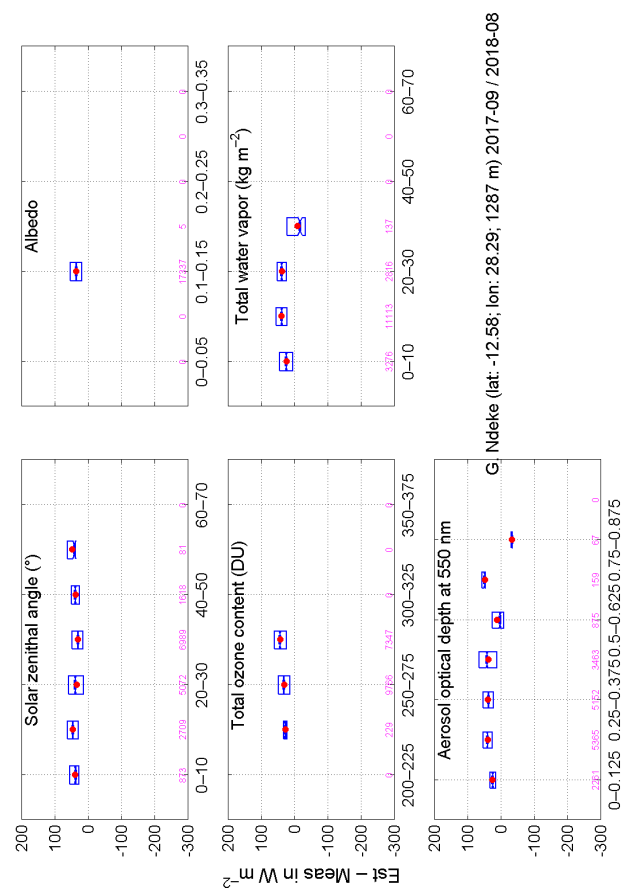
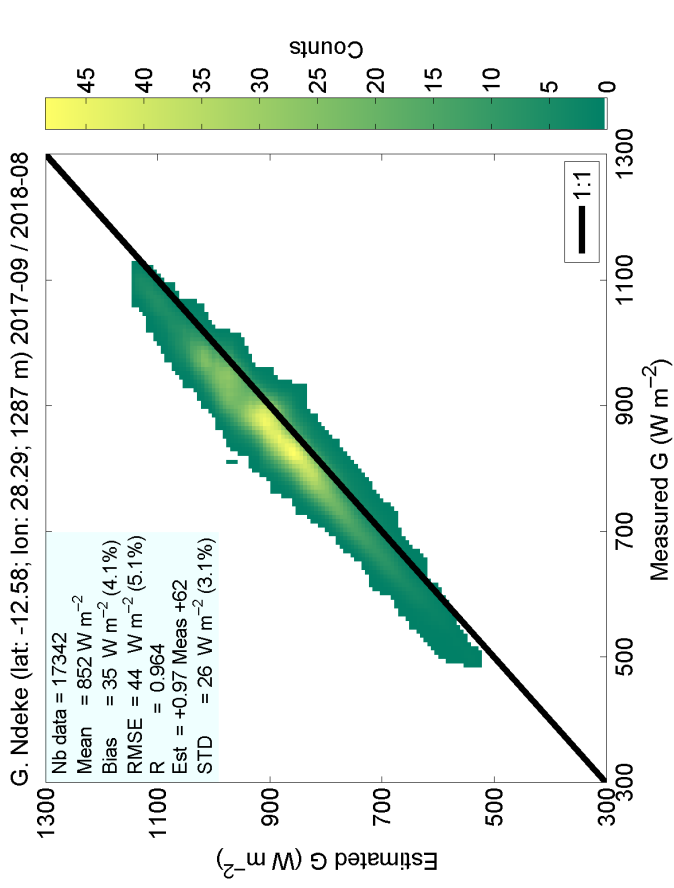
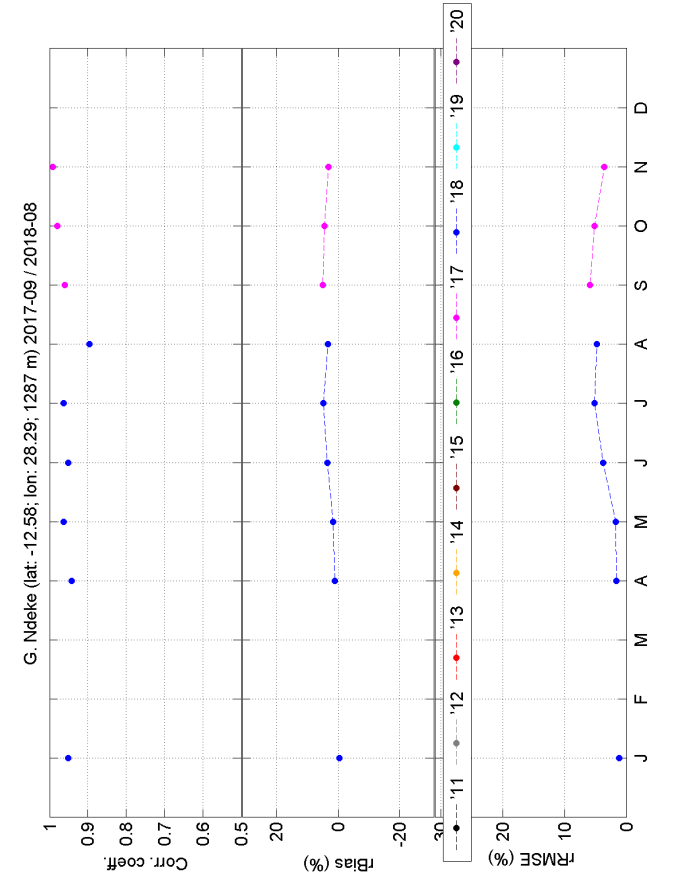


Figure S65: Comparison of global irradiance at Ndeke

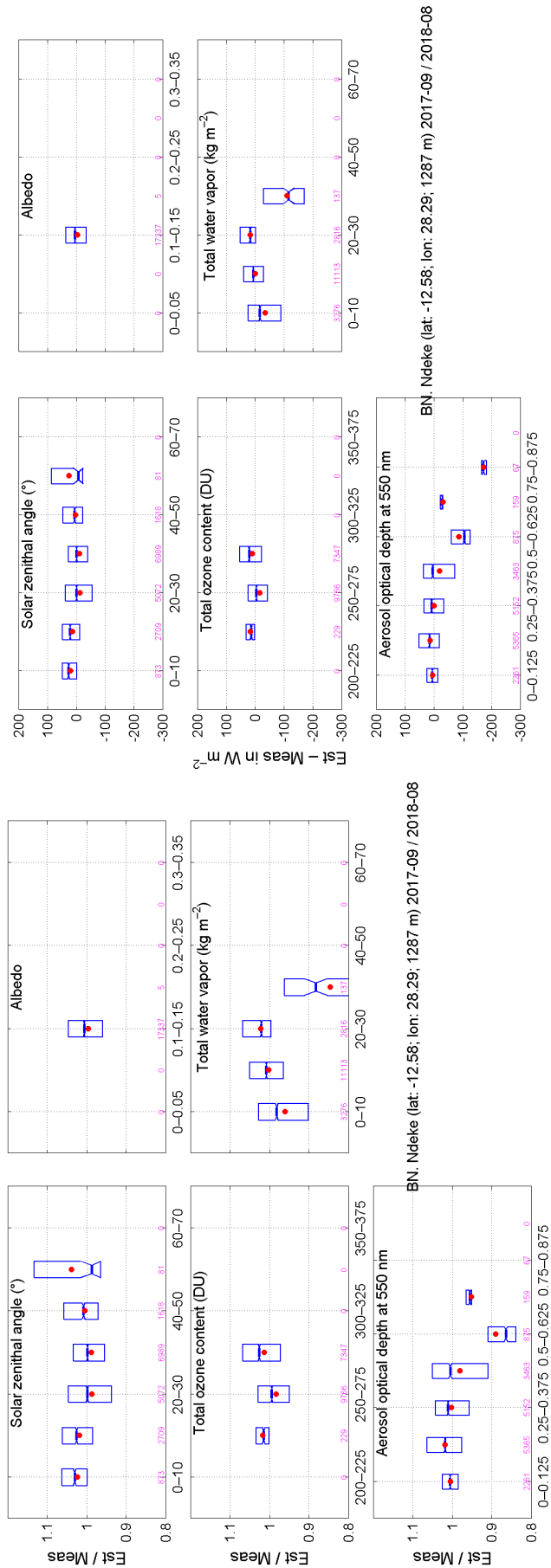
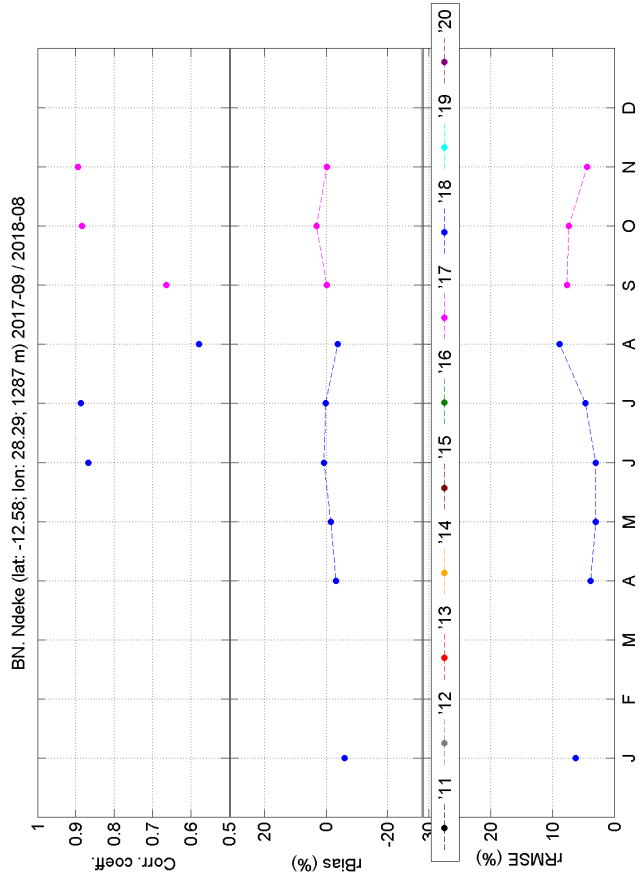
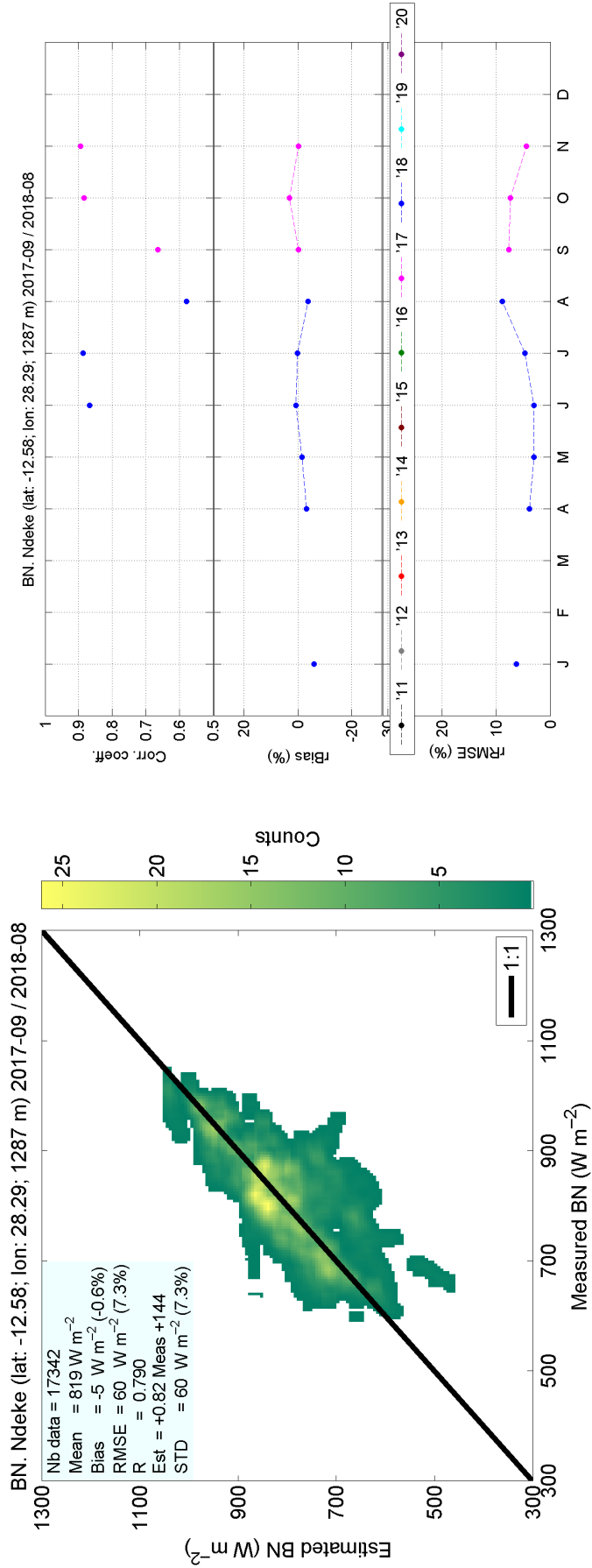
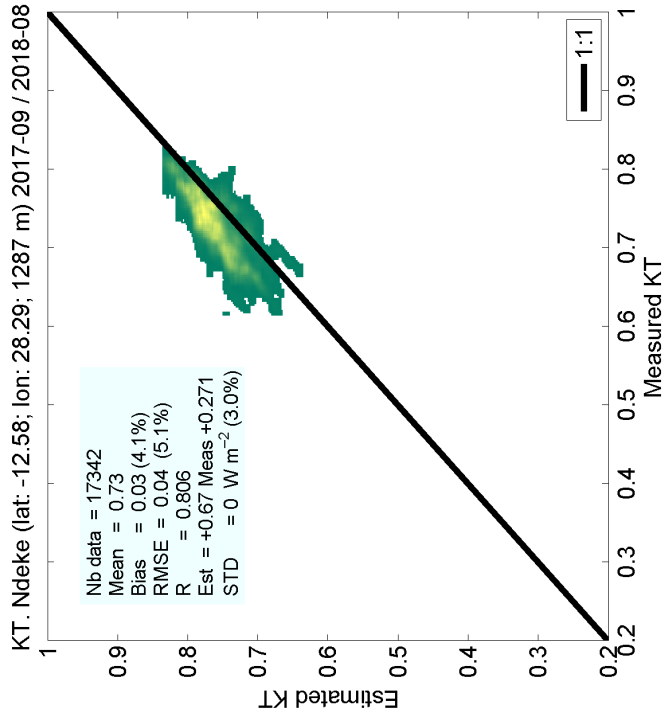


Figure S66: Comparison on direct component at normal irradiance at Ndeke



KT. Ndeke (lat: -12.58; lon: 28.29; 1287 m) 2017-09 / 2018-08

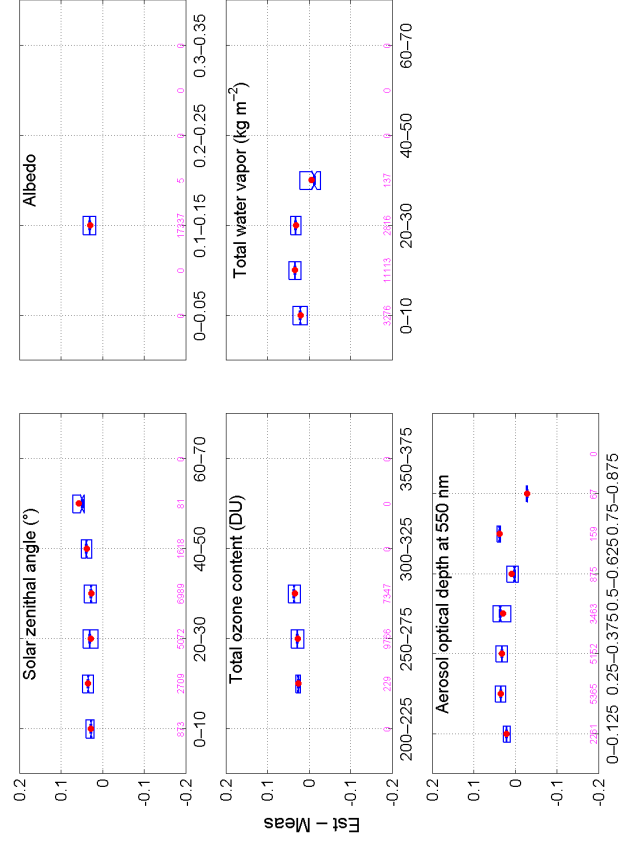
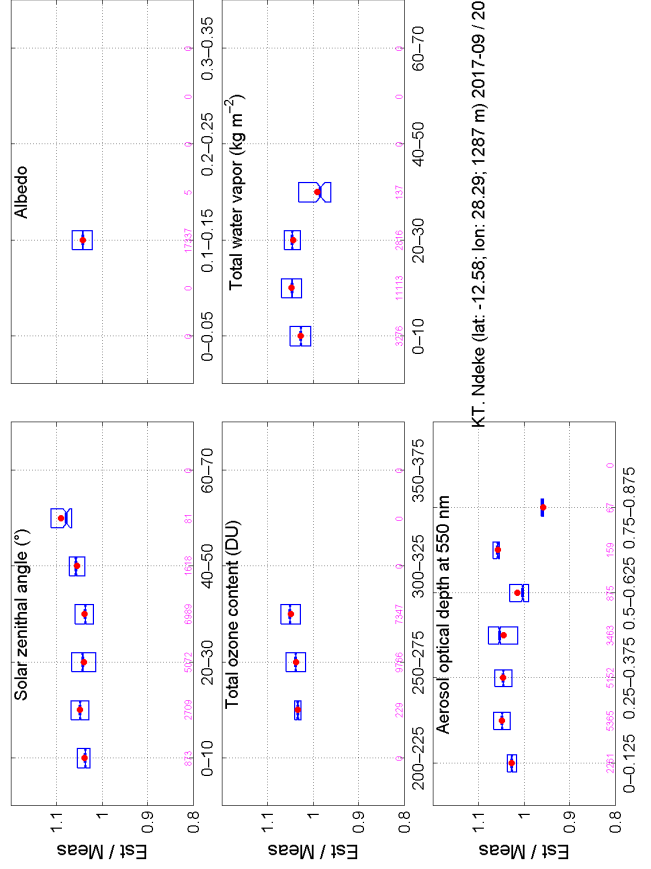
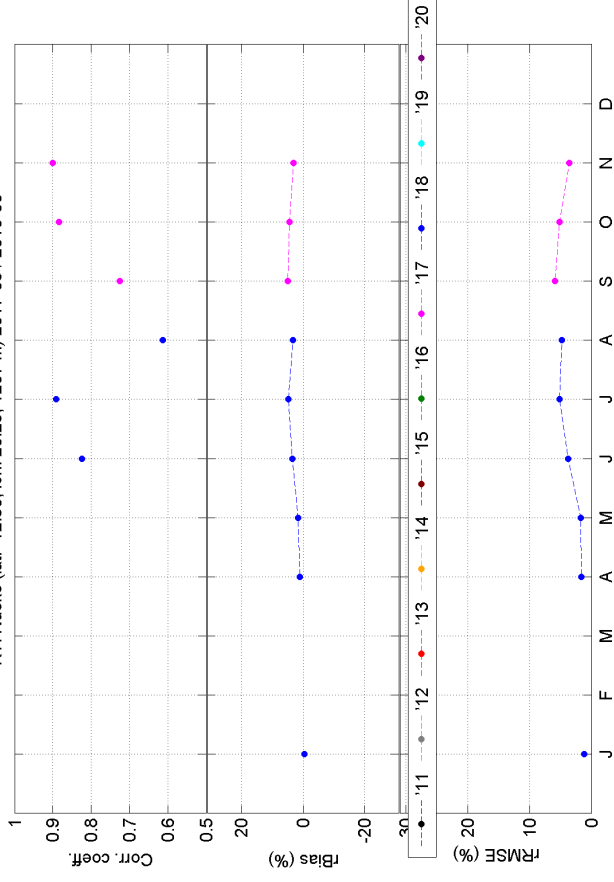
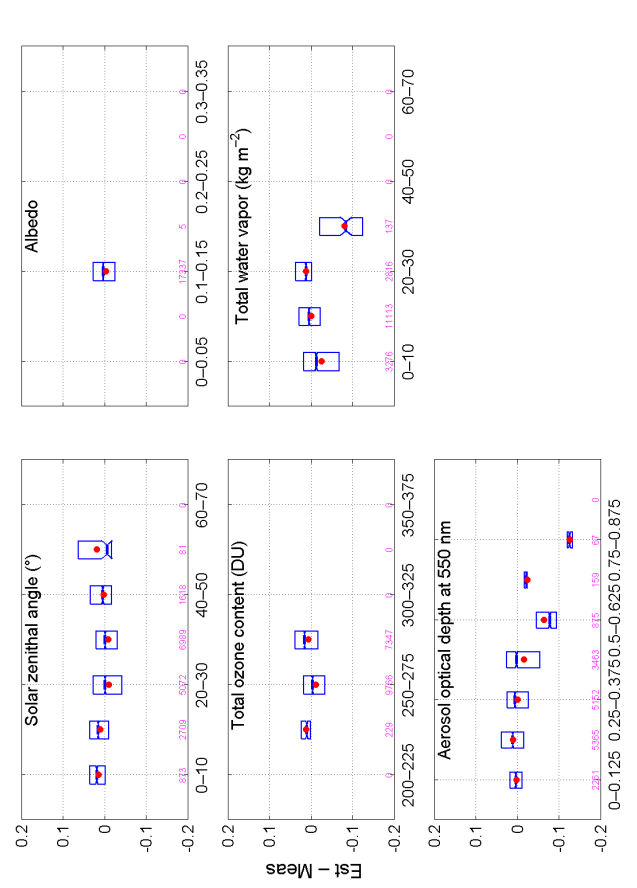
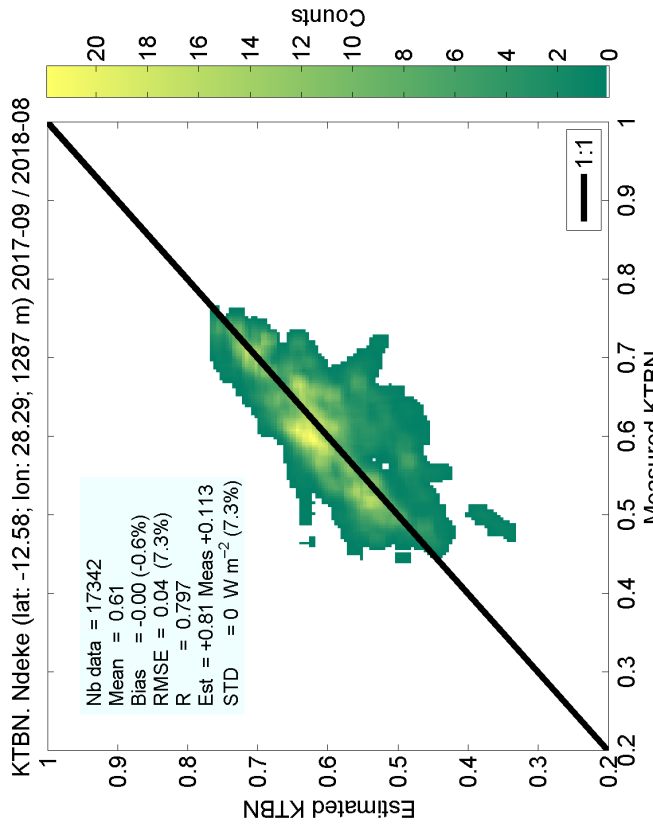
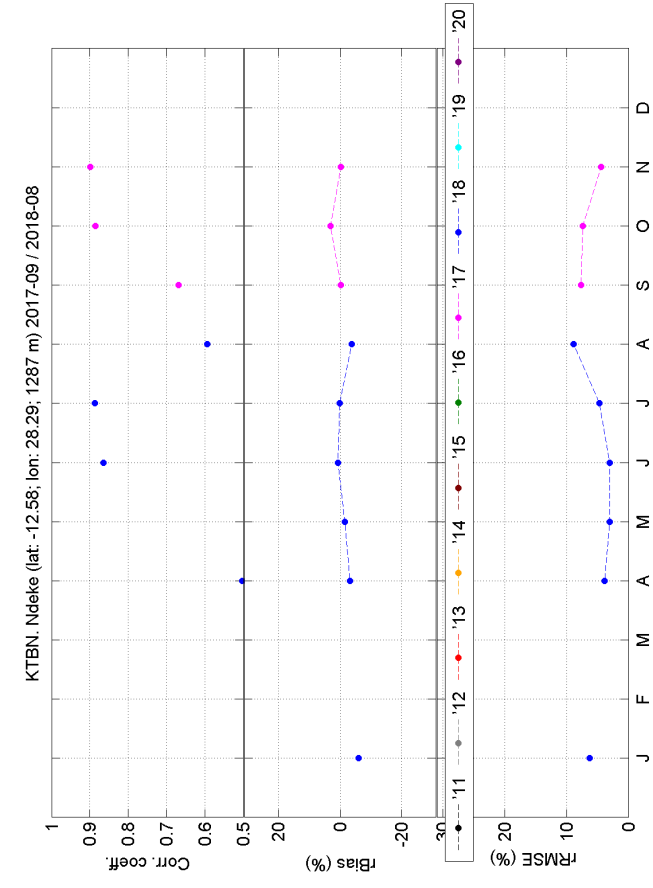


Figure S67: Comparison on clearness index at Ndeke



KTBN, Ndeke (lat: -12.58; lon: 28.29; 1287 m) 2017-09 / 2018-08

Figure S68: Comparison on direct clearness index at Ndeke

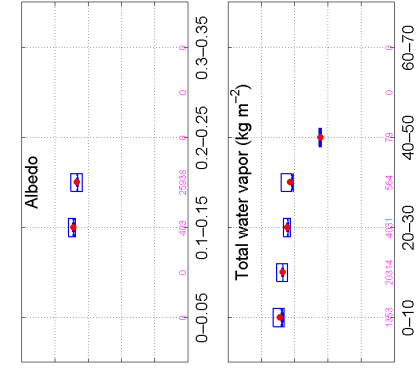
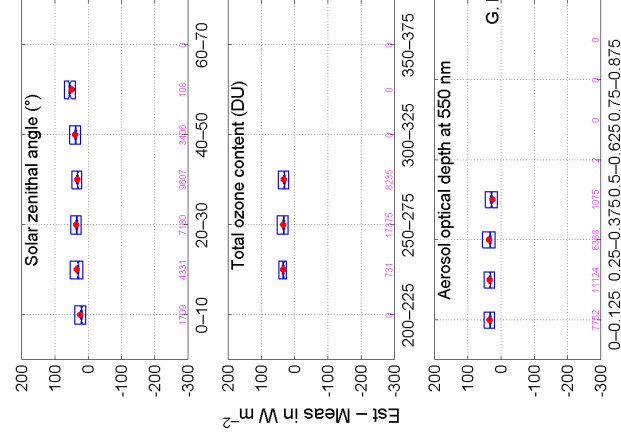
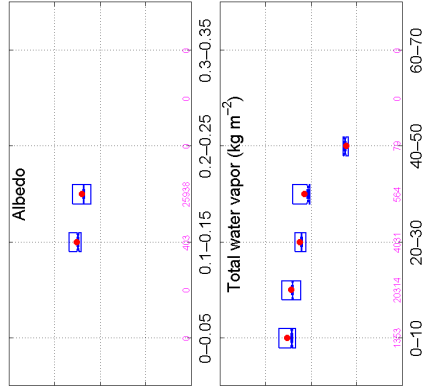
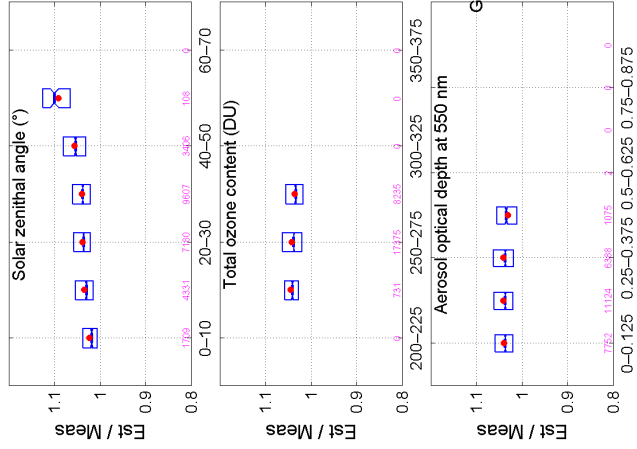
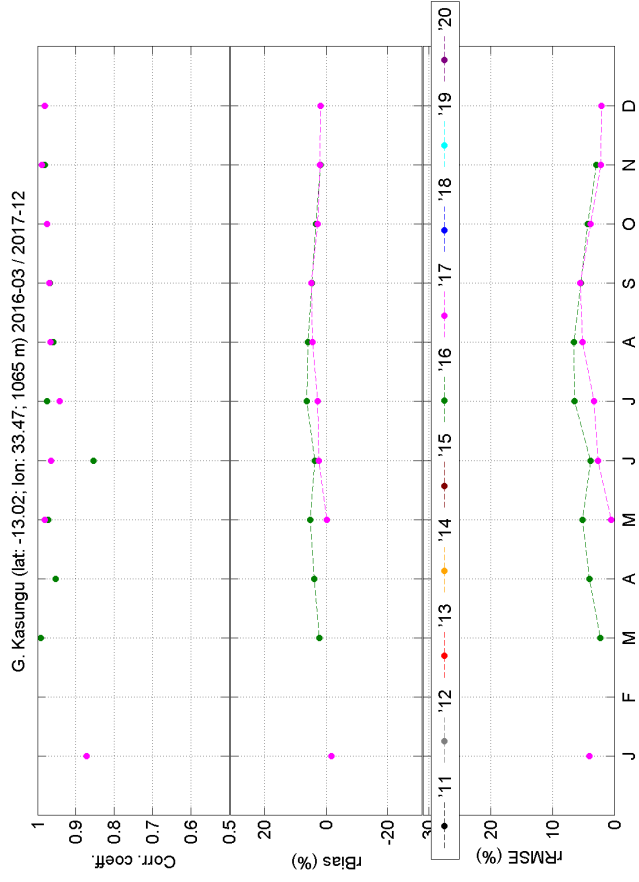
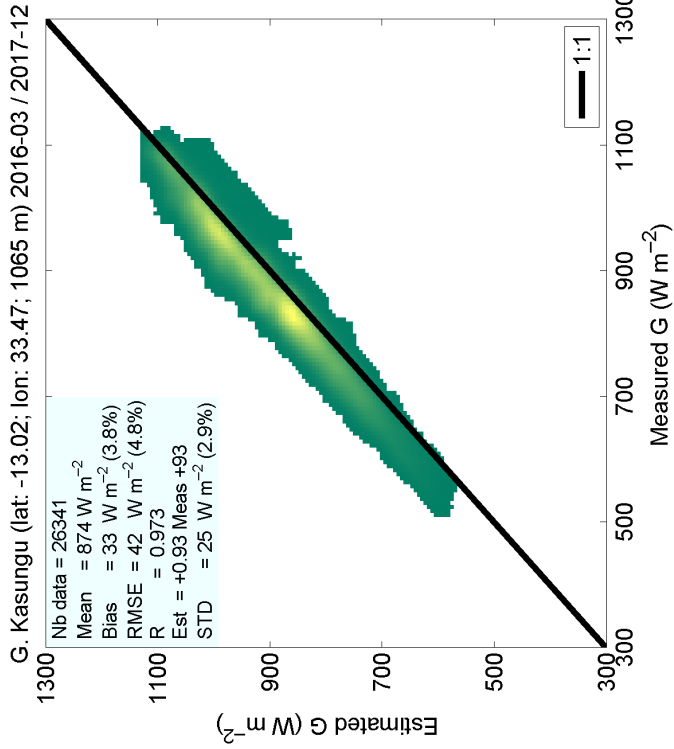


Figure S69: Comparison on global irradiance at Kasungu

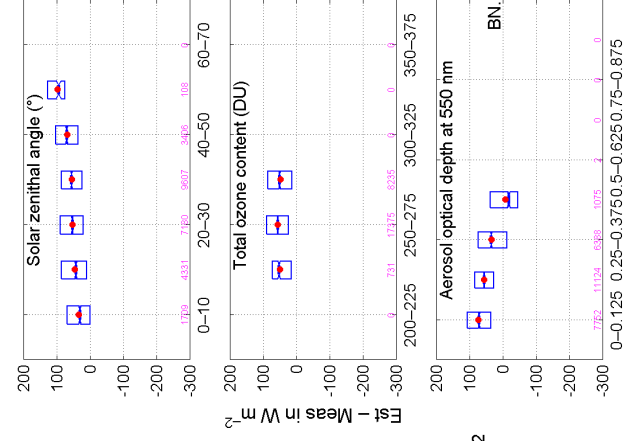
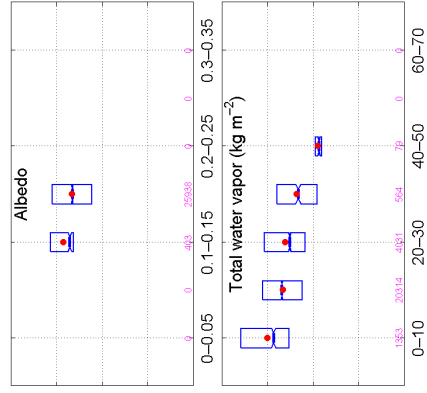
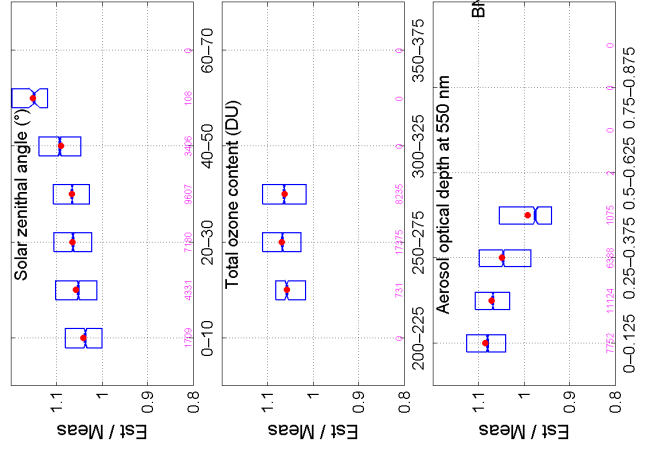
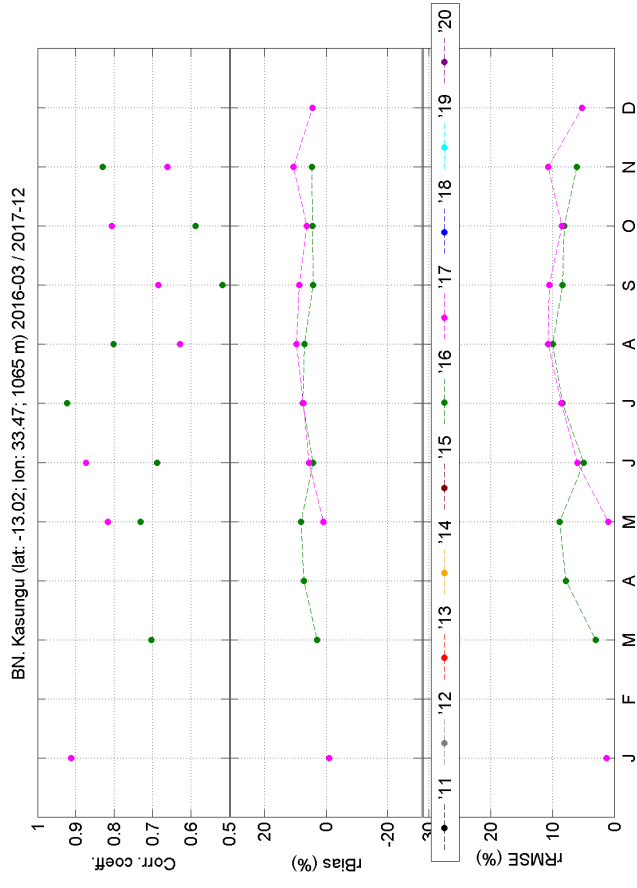
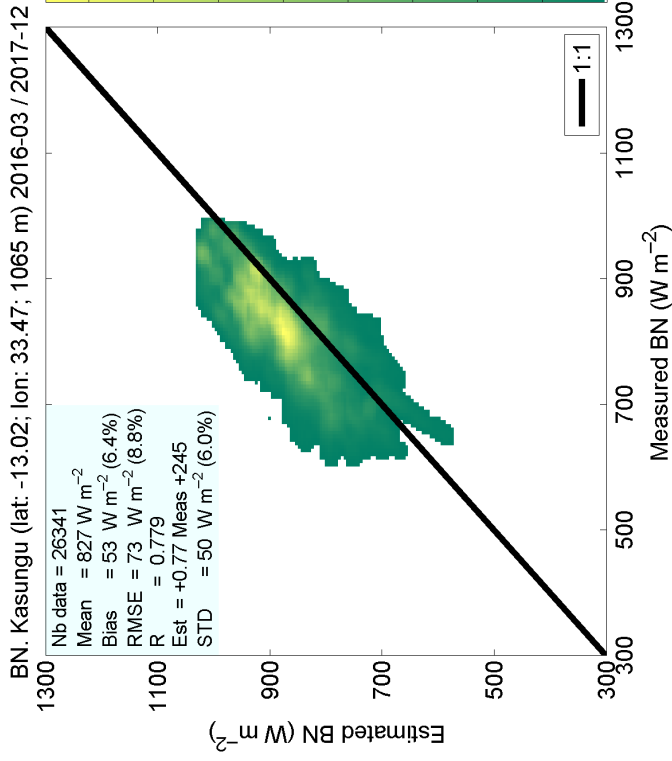


Figure S70: Comparison on direct component at normal irradiance at Kasungu

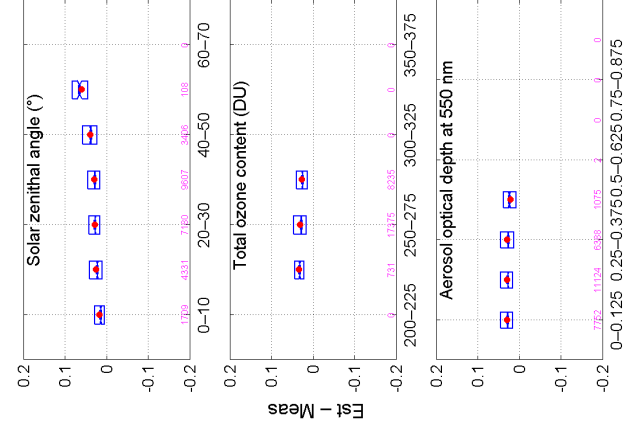
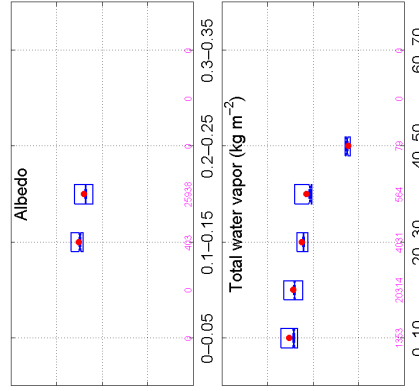
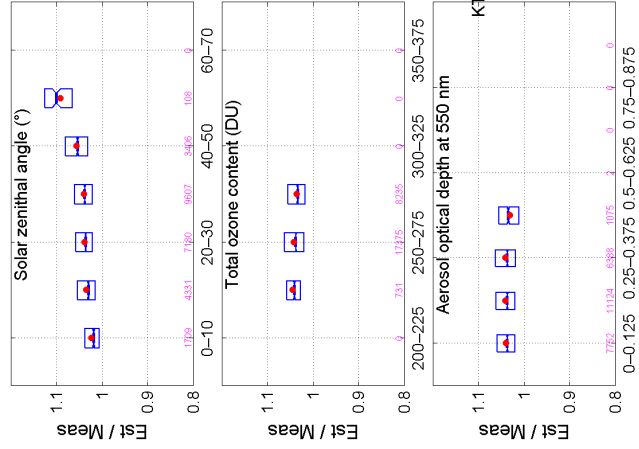
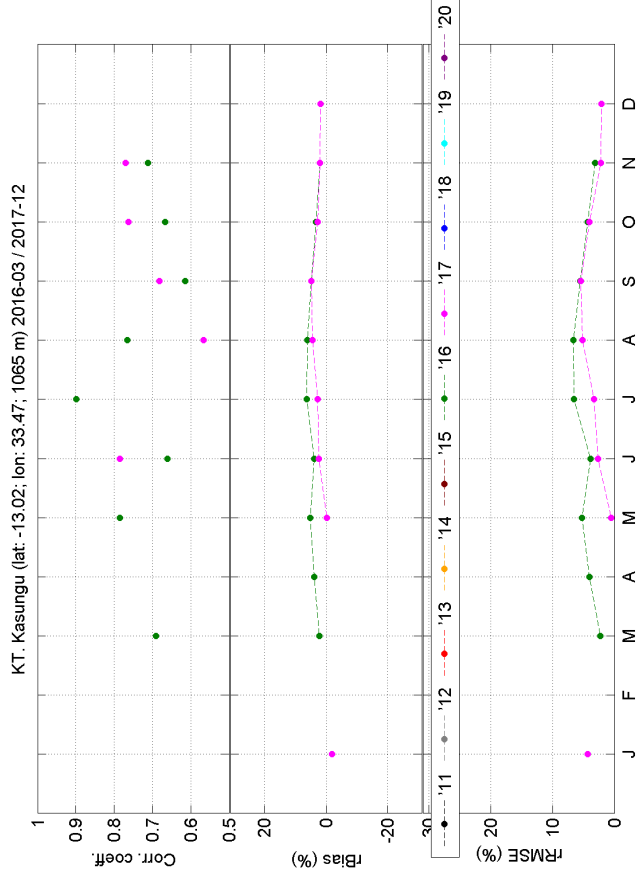
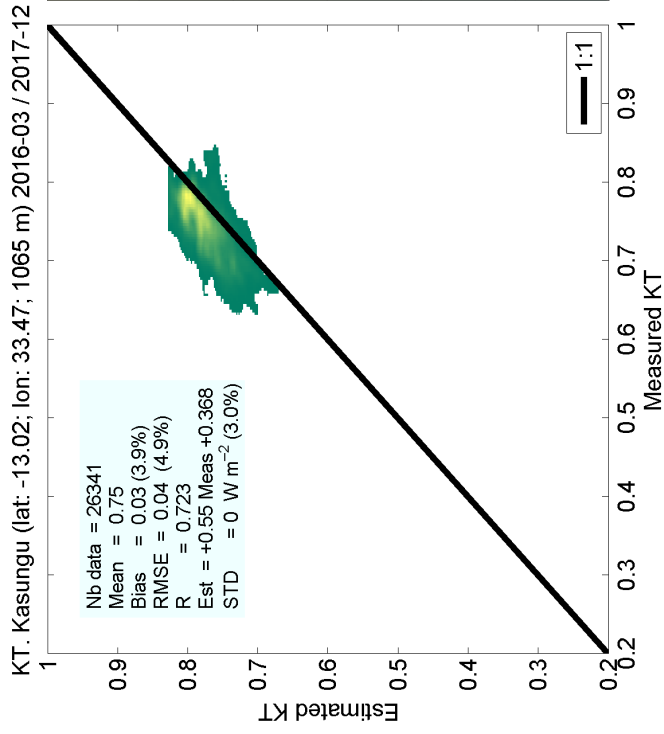


Figure S71: Comparison on clearness index at Kasungu

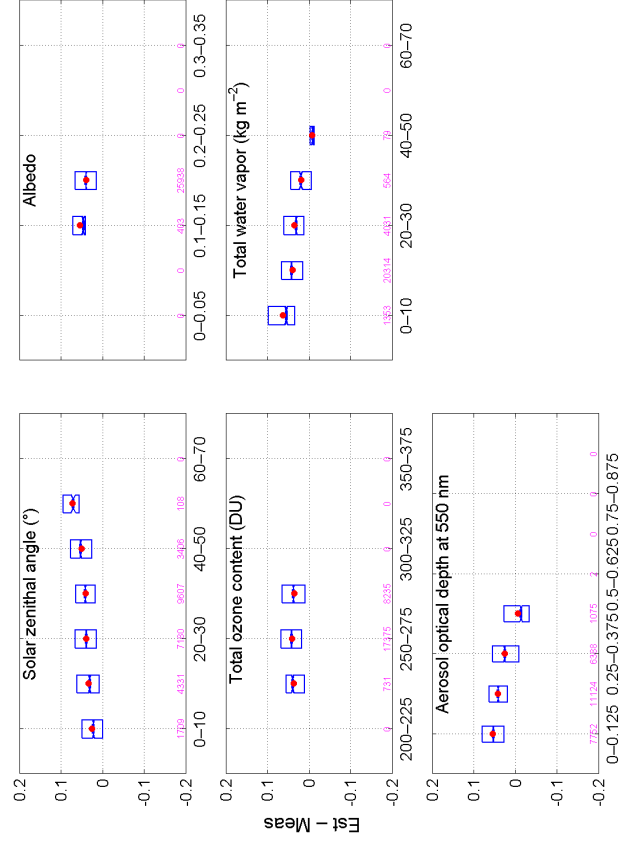
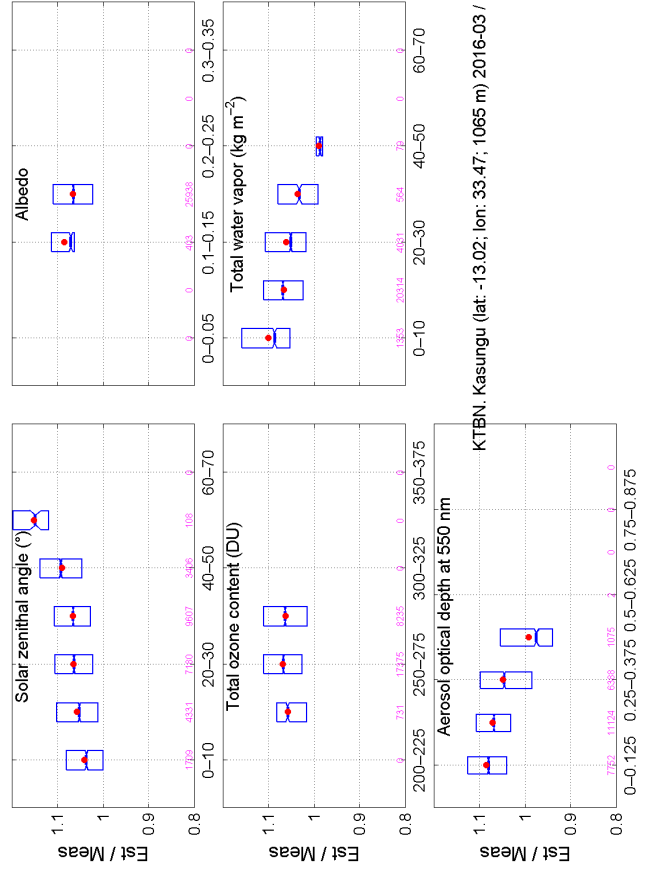
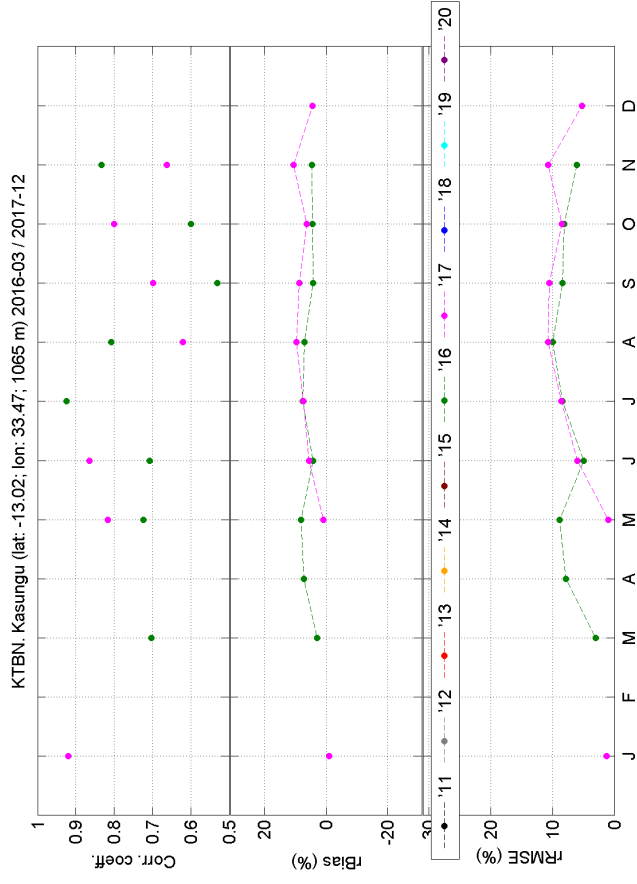
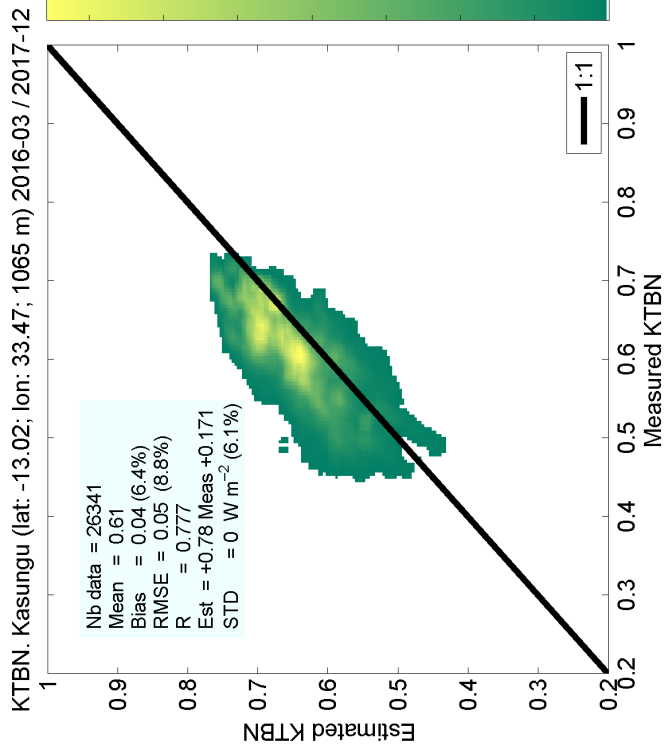


Figure S72: Comparison on direct clearness index at Kasungu

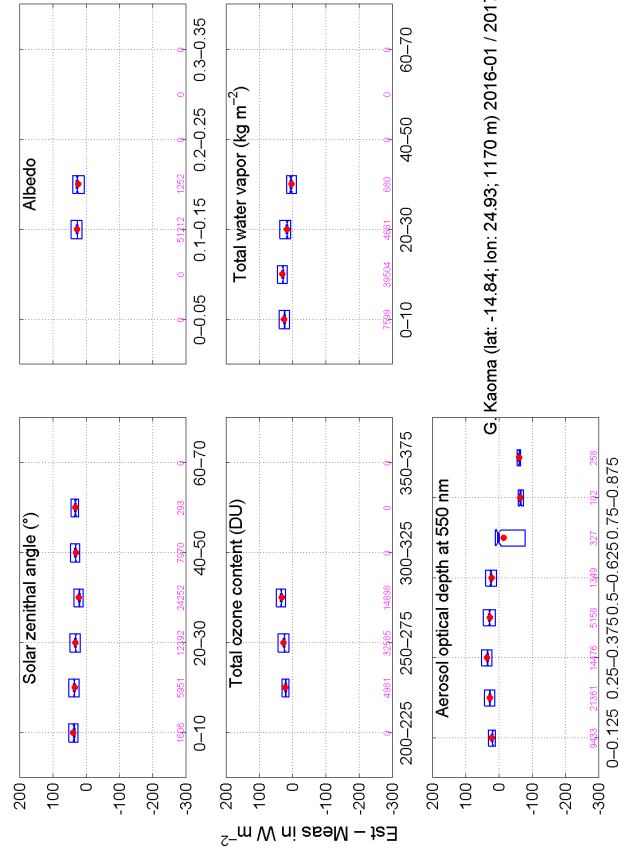
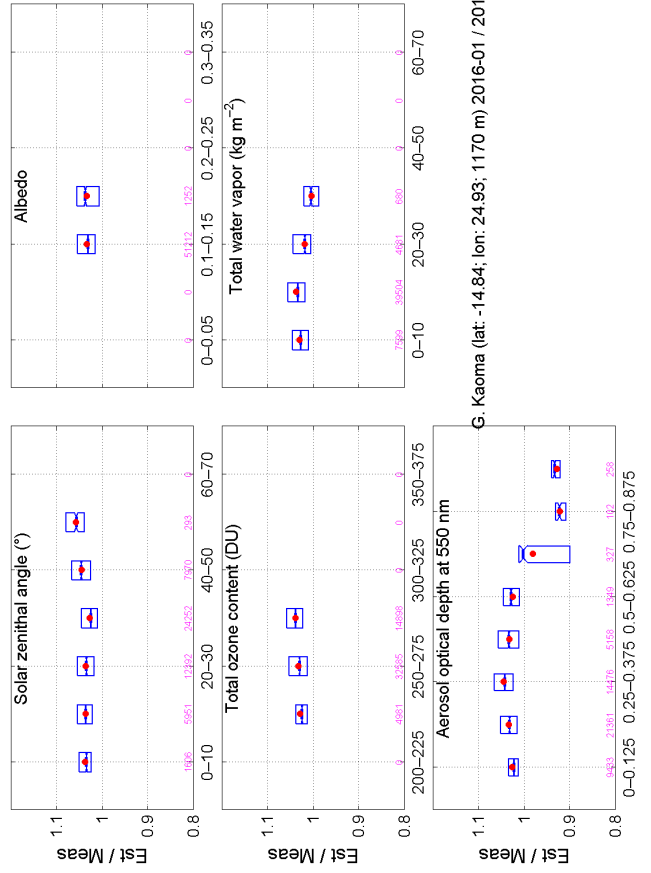
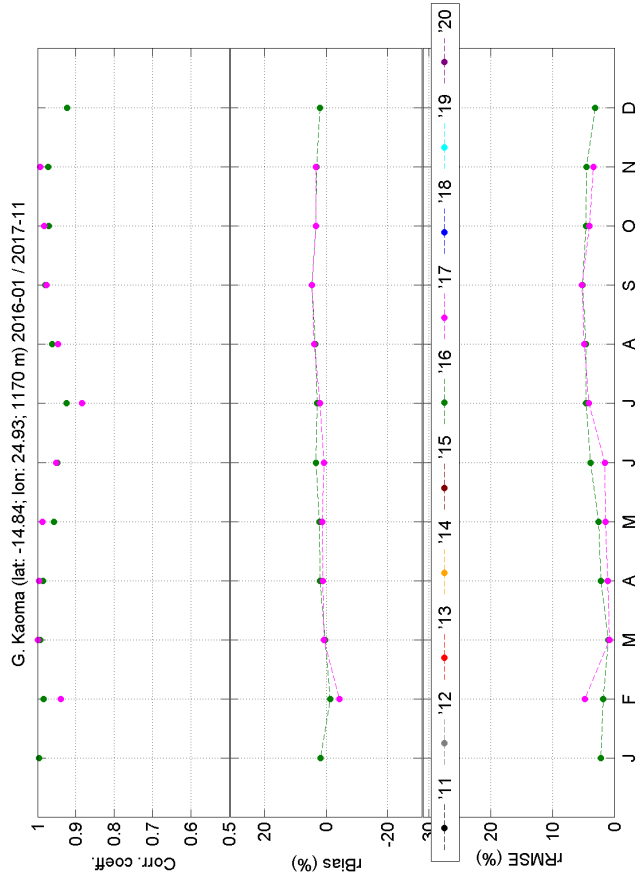
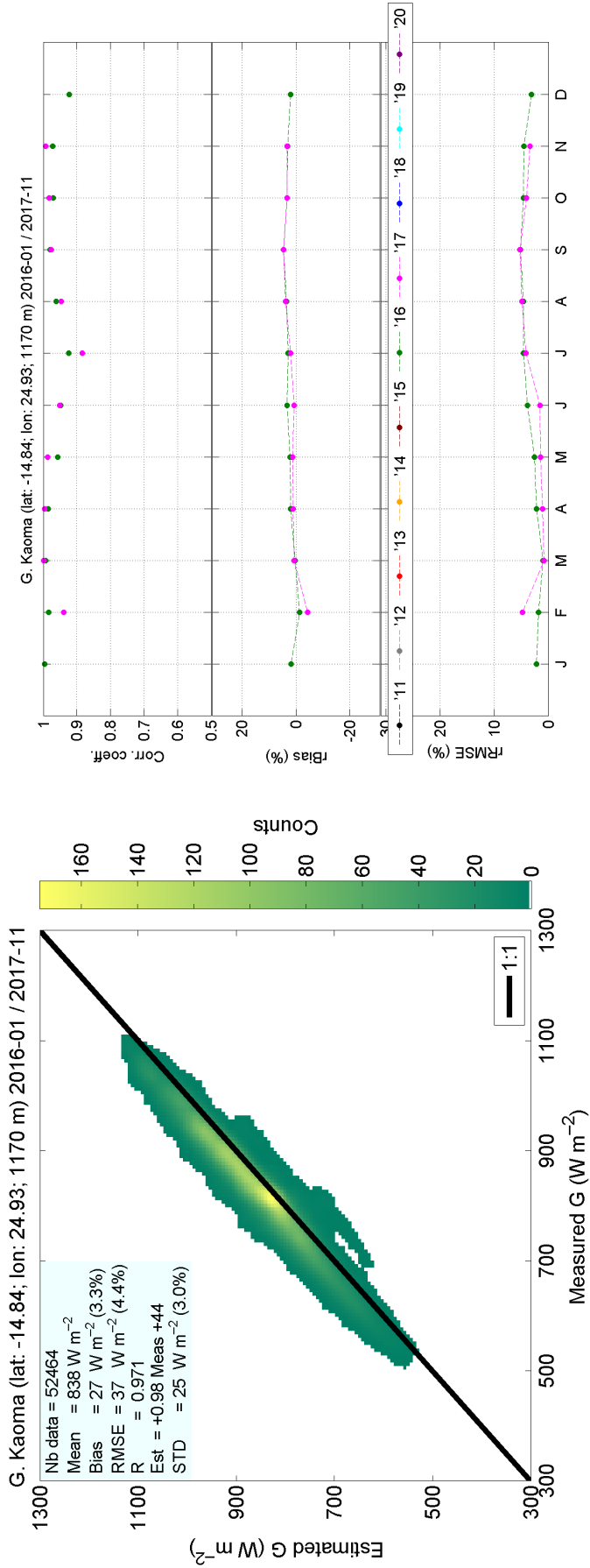


Figure S73: Comparison on global irradiance at Kaoma

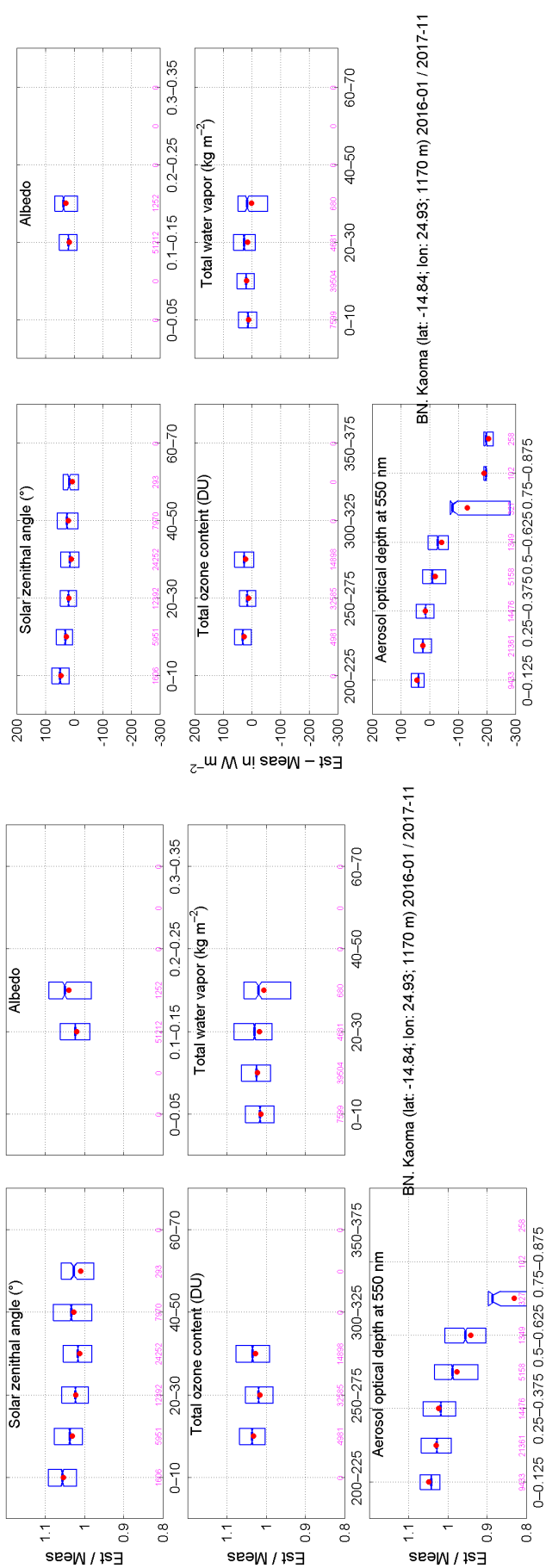
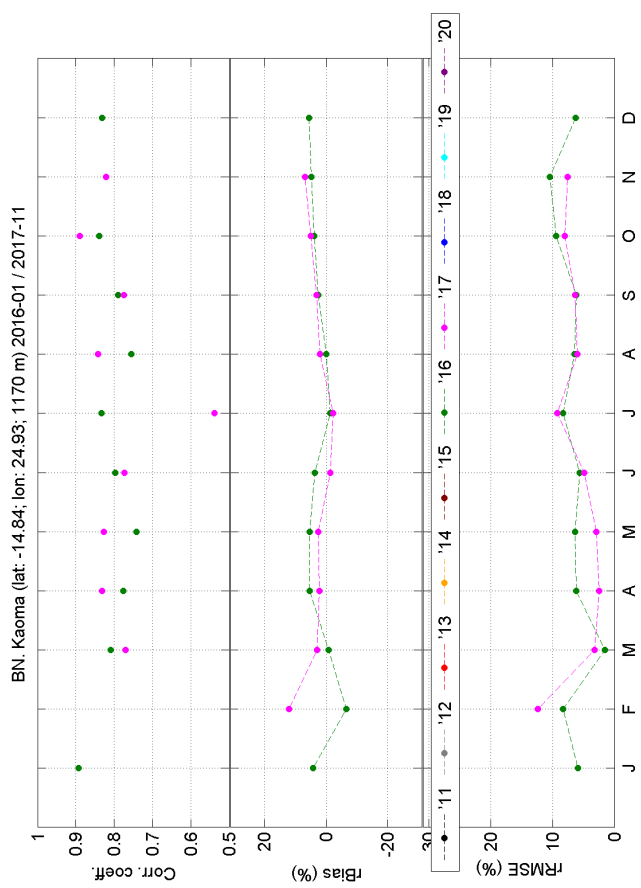
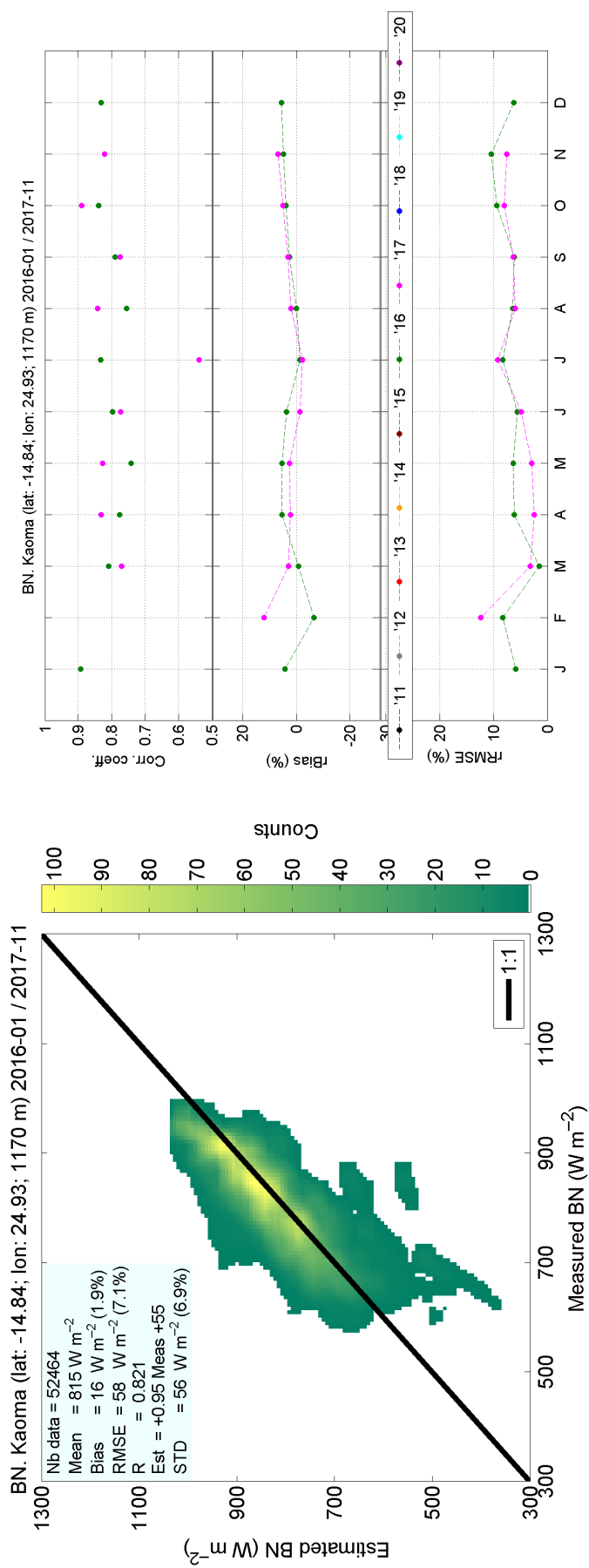


Figure S74: Comparison on direct component at normal irradiance at Kaoma

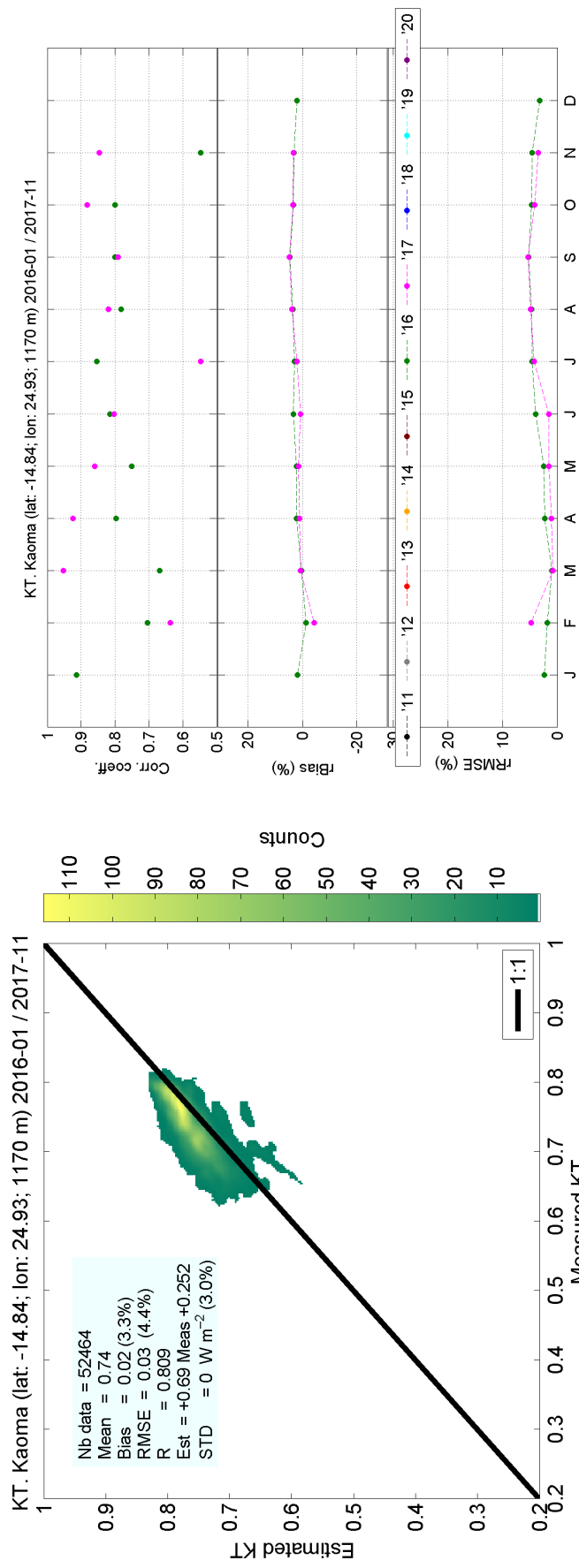


Figure S75: Comparison on clearness index at Kaoma

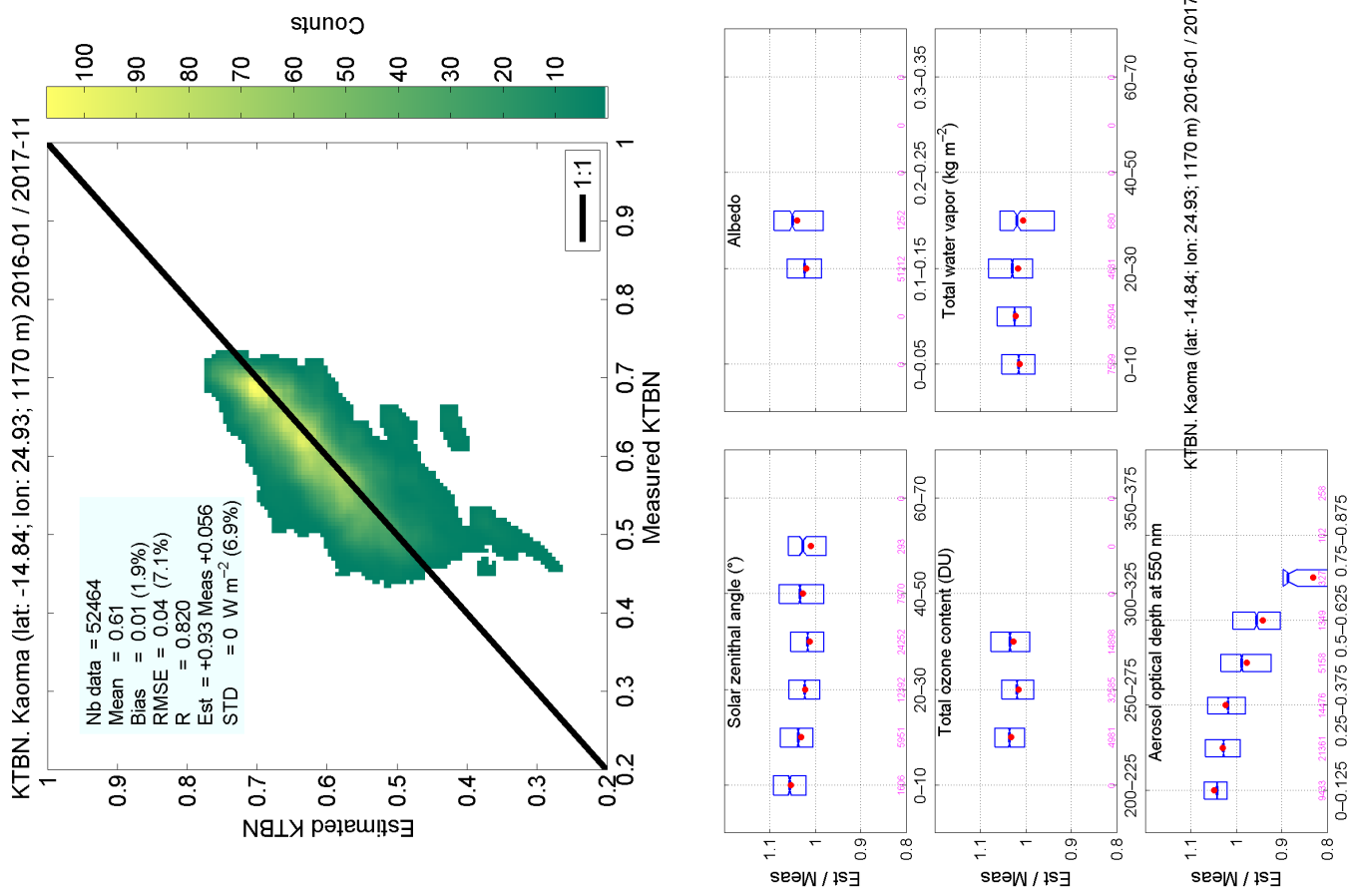
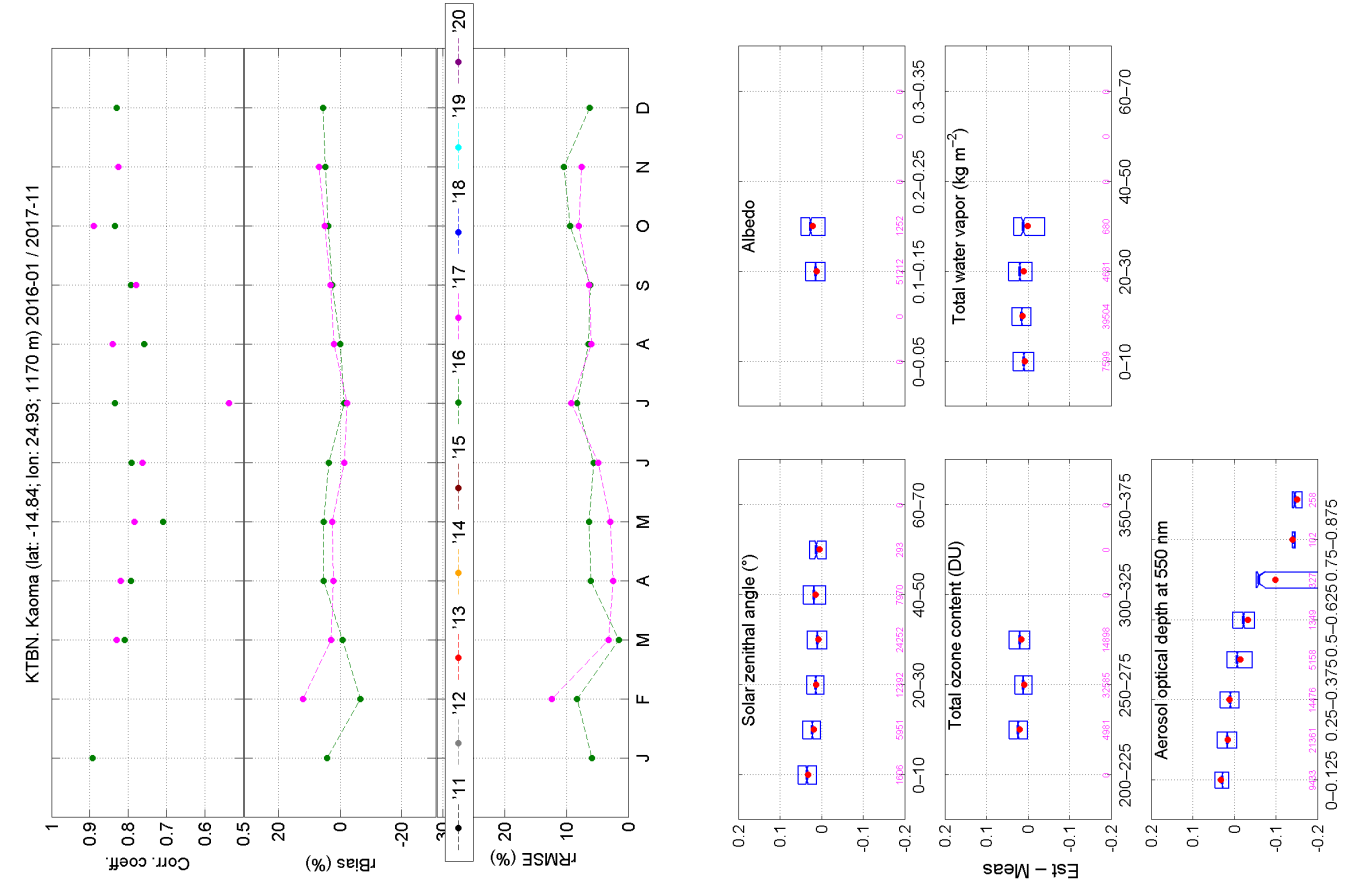
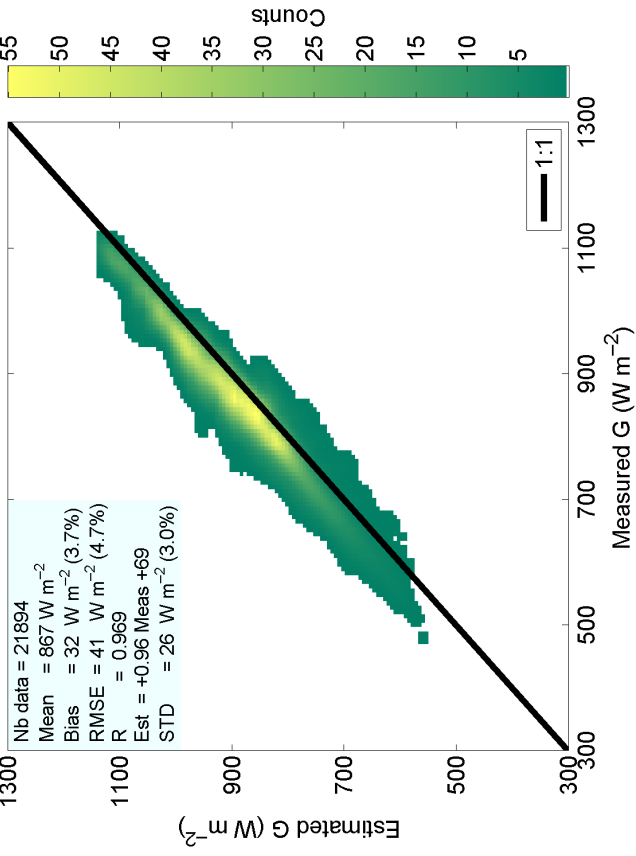
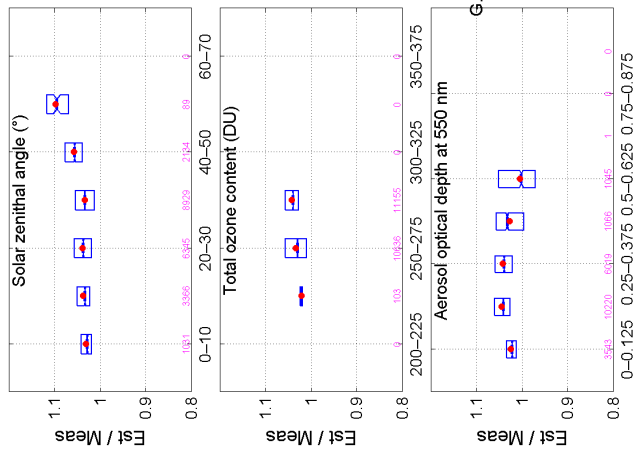
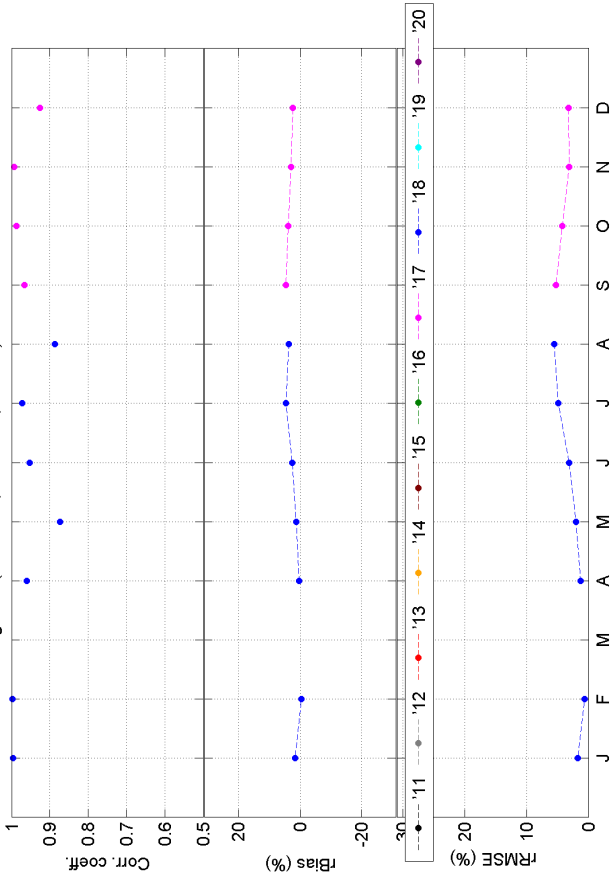


Figure S76: Comparison on direct clearness index at Kaoma

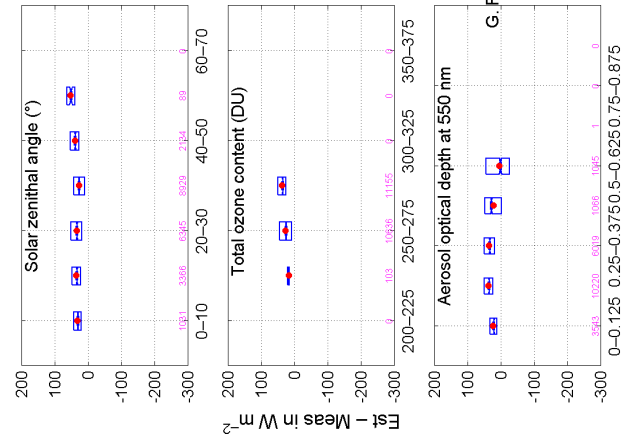
G. Fig Tree (lat: -15.00; lon: 28.55; 1143 m) 2017-09 / 2018-08



G. Fig Tree (lat: -15.00; lon: 28.55; 1143 m) 2017-09 / 2018-08

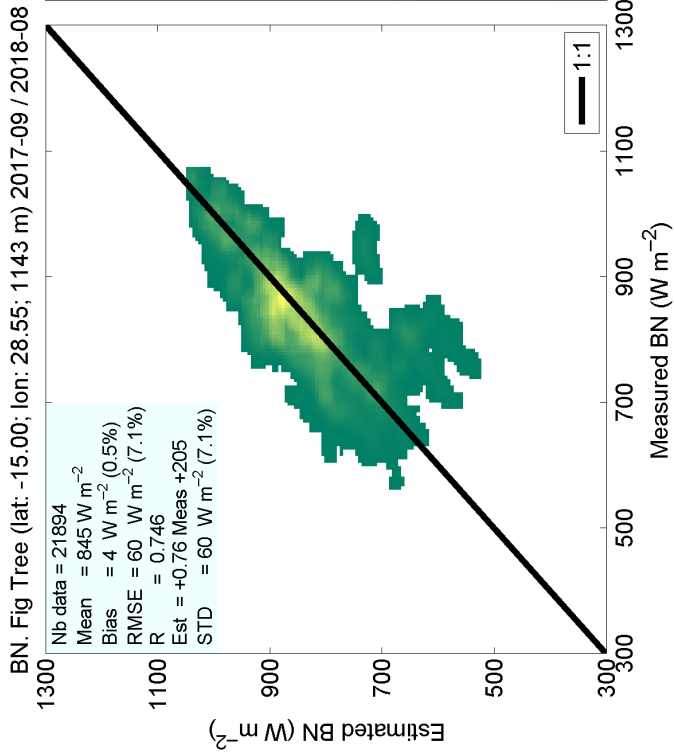


G. Fig Tree (lat: -15.00; lon: 28.55; 1143 m) 2017-09 / 2018-08



G. Fig Tree (lat: -15.00; lon: 28.55; 1143 m) 2017-09 / 2018-08

Figure S77: Comparison on global irradiance at Fig Tree



BN, Fig Tree (lat: -15.00; lon: 28.55; 1143 m) 2017-09 / 2018-08

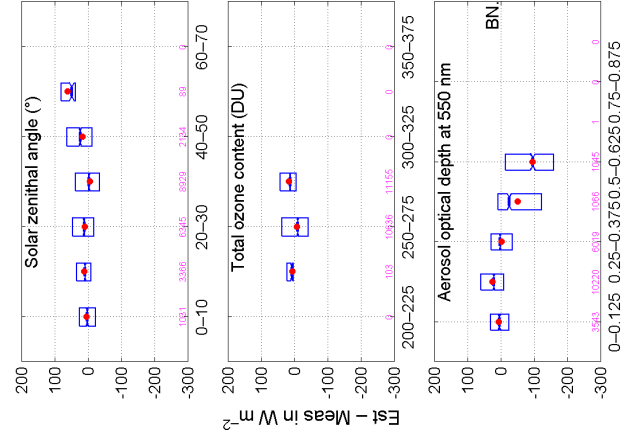
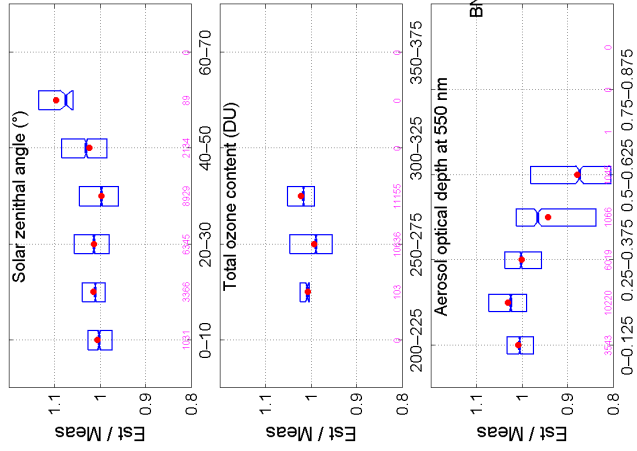
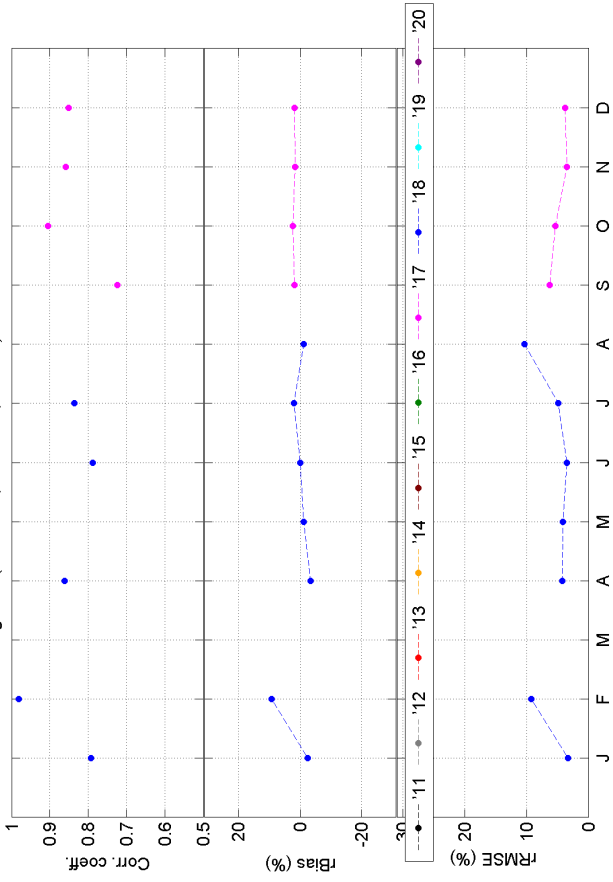
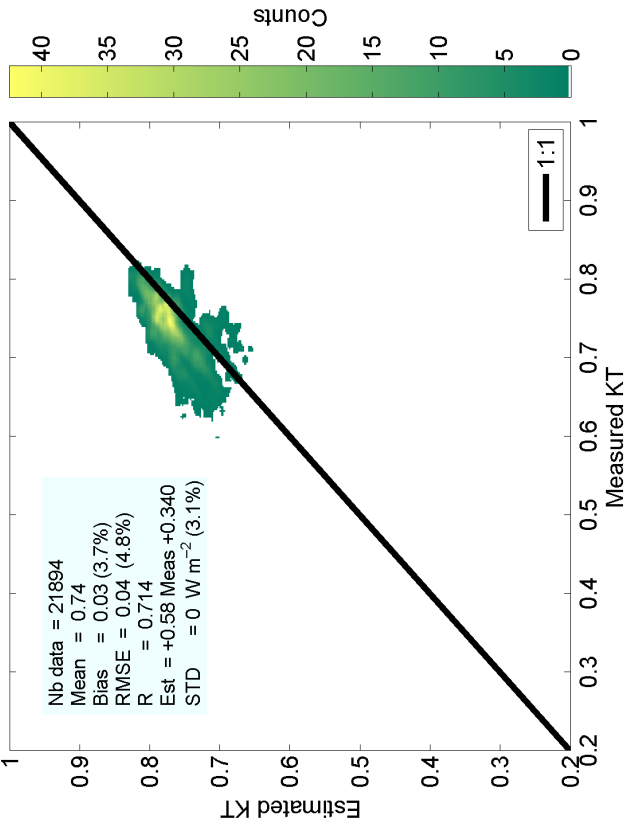
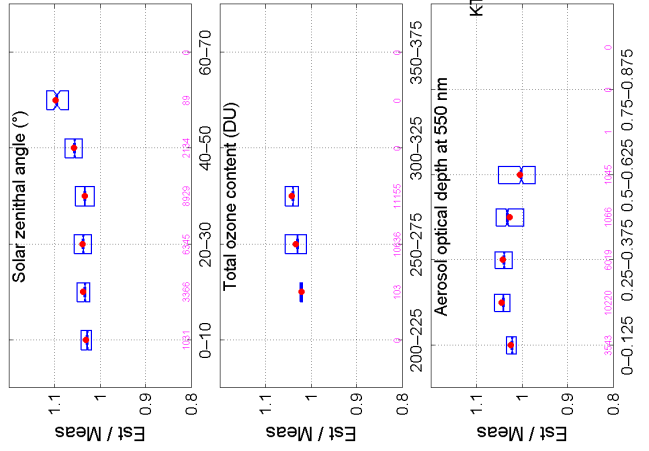
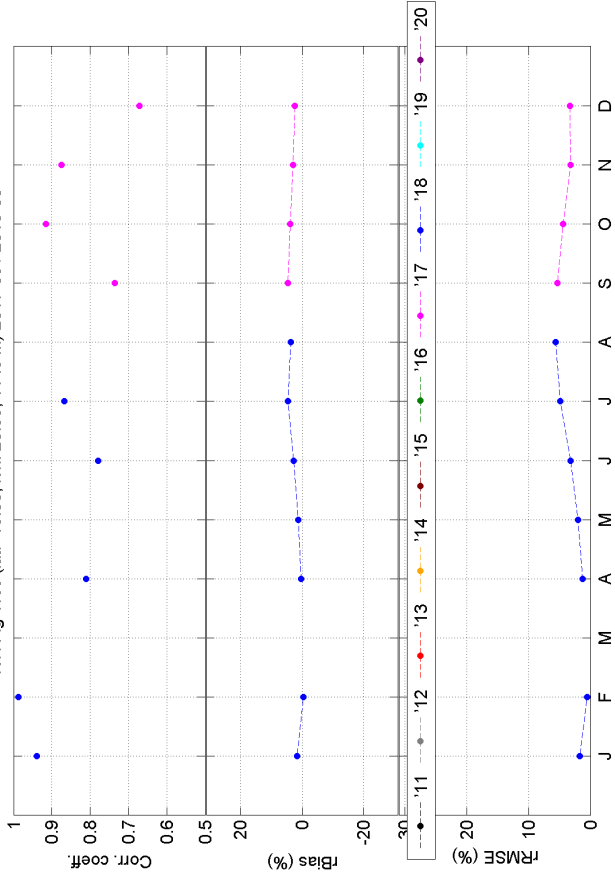


Figure S78: Comparison on direct component at normal irradiance at Fig Tree

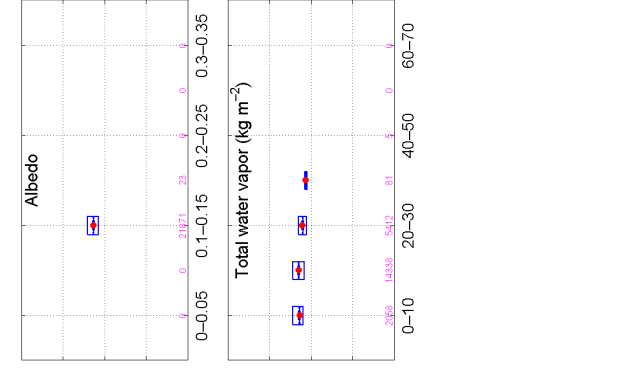
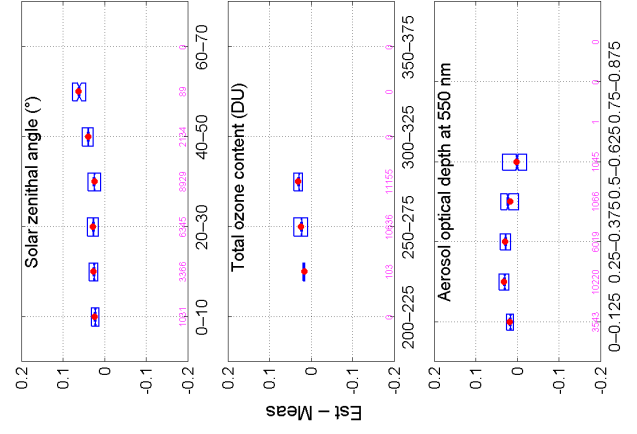
KT. Fig Tree (lat: -15.00; lon: 28.55; 1143 m) 2017-09 / 2018-08



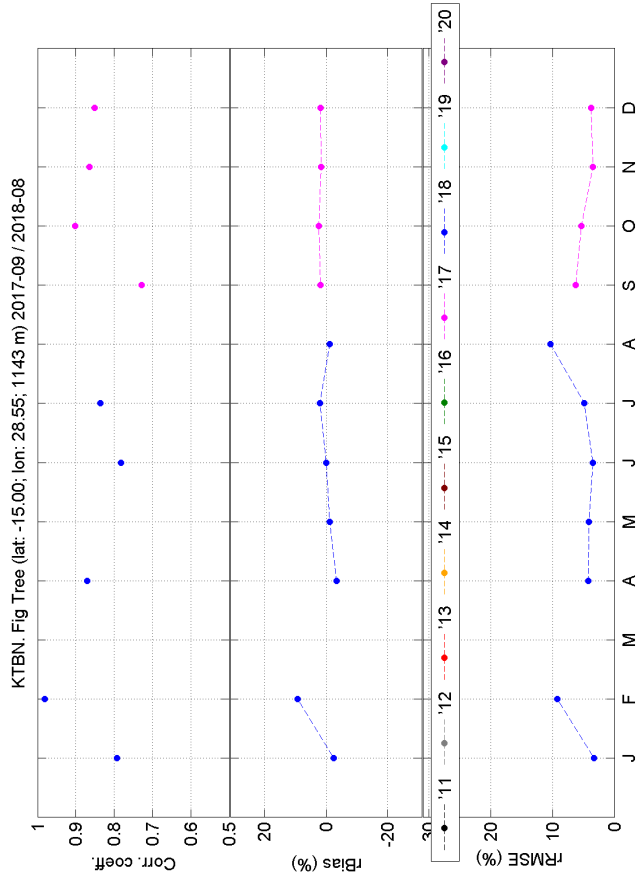
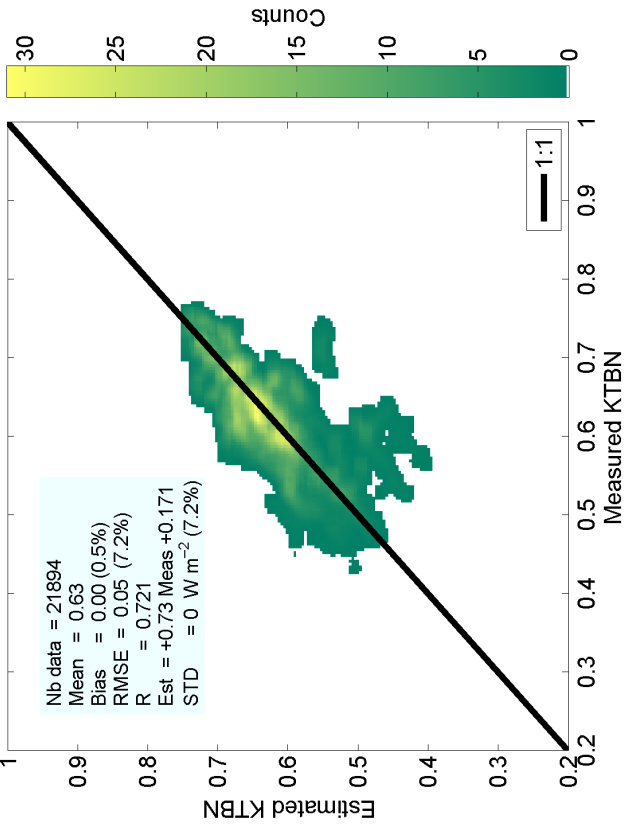
KT. Fig Tree (lat: -15.00; lon: 28.55; 1143 m) 2017-09 / 2018-08



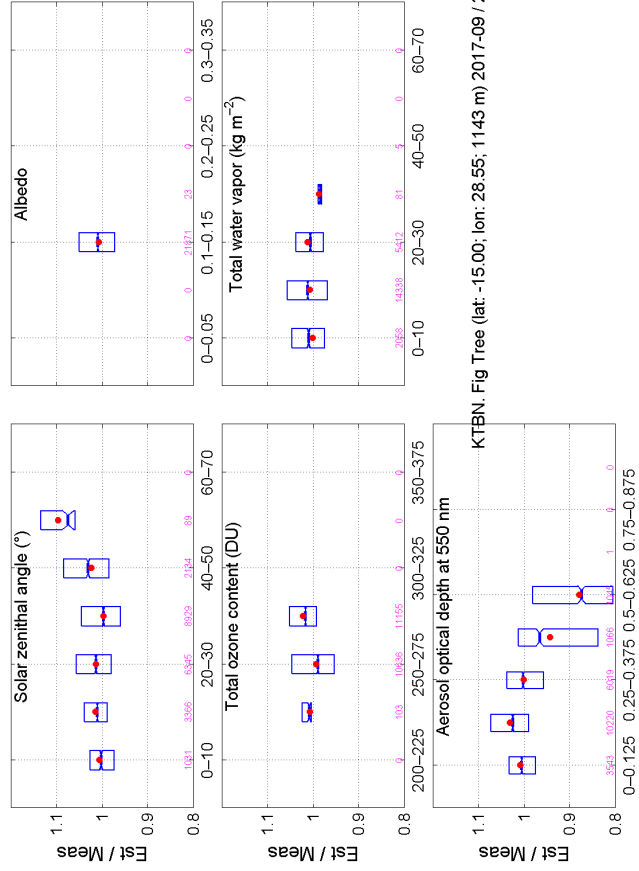
KT. Fig Tree (lat: -15.00; lon: 28.55; 1143 m) 2017-09 / 2018-08



KTBN. Fig Tree (lat: -15.00; lon: 28.55; 1143 m) 2017-09 / 2018-08



KTBN. Fig Tree (lat: -15.00; lon: 28.55; 1143 m) 2017-09 / 2018-08



KTBN. Fig Tree (lat: -15.00; lon: 28.55; 1143 m) 2017-09 / 2018-08

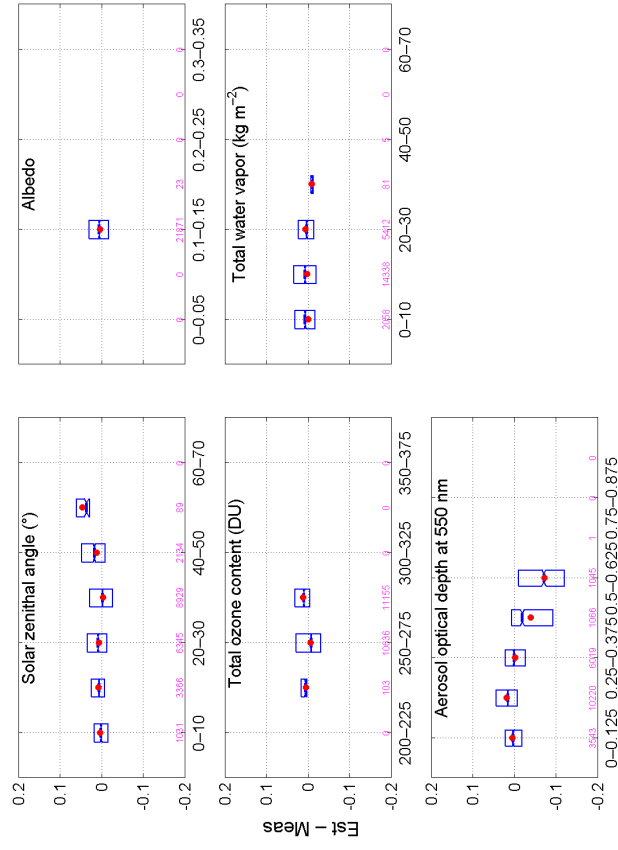


Figure S80: Comparison on direct clearness index at Fig Tree

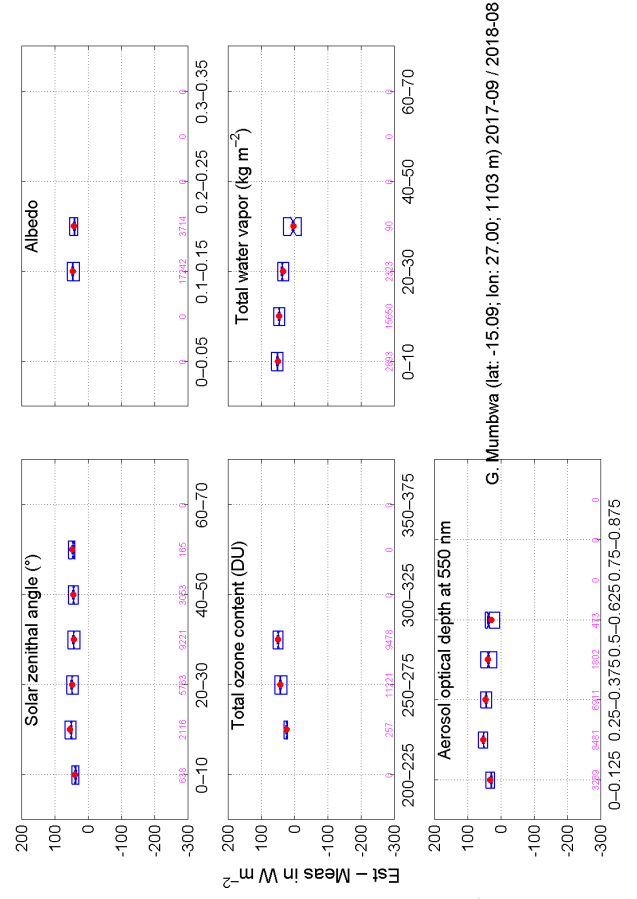
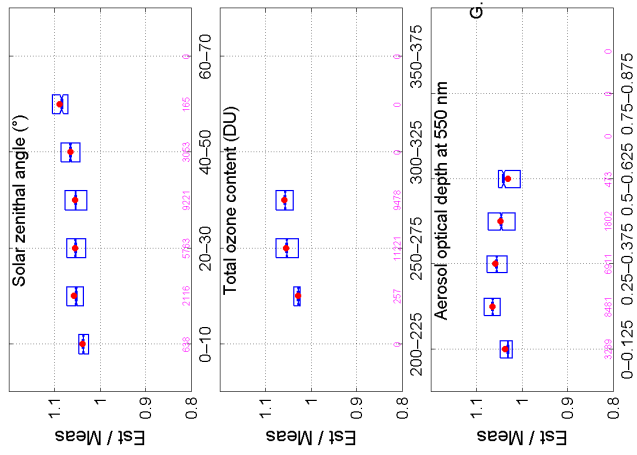
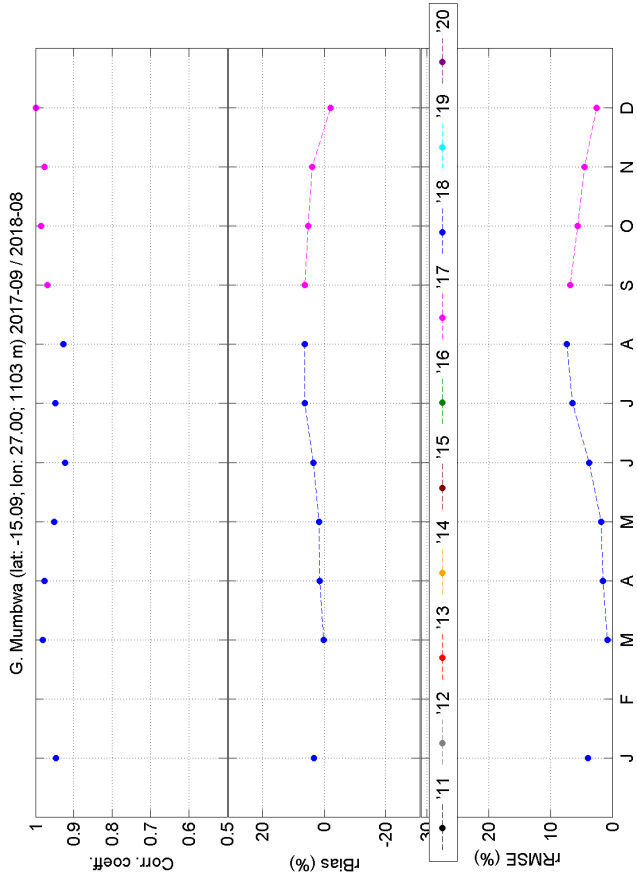
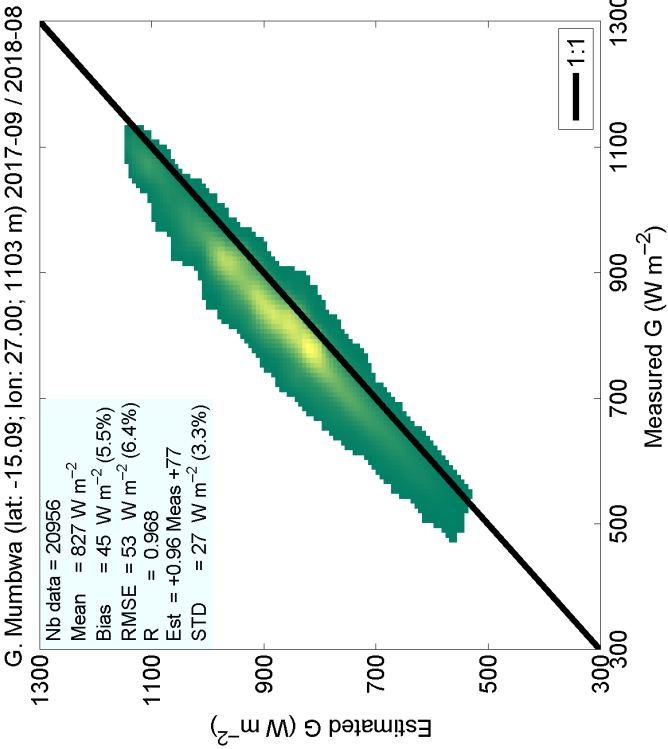


Figure S81: Comparison on global irradiance at Mumbwa

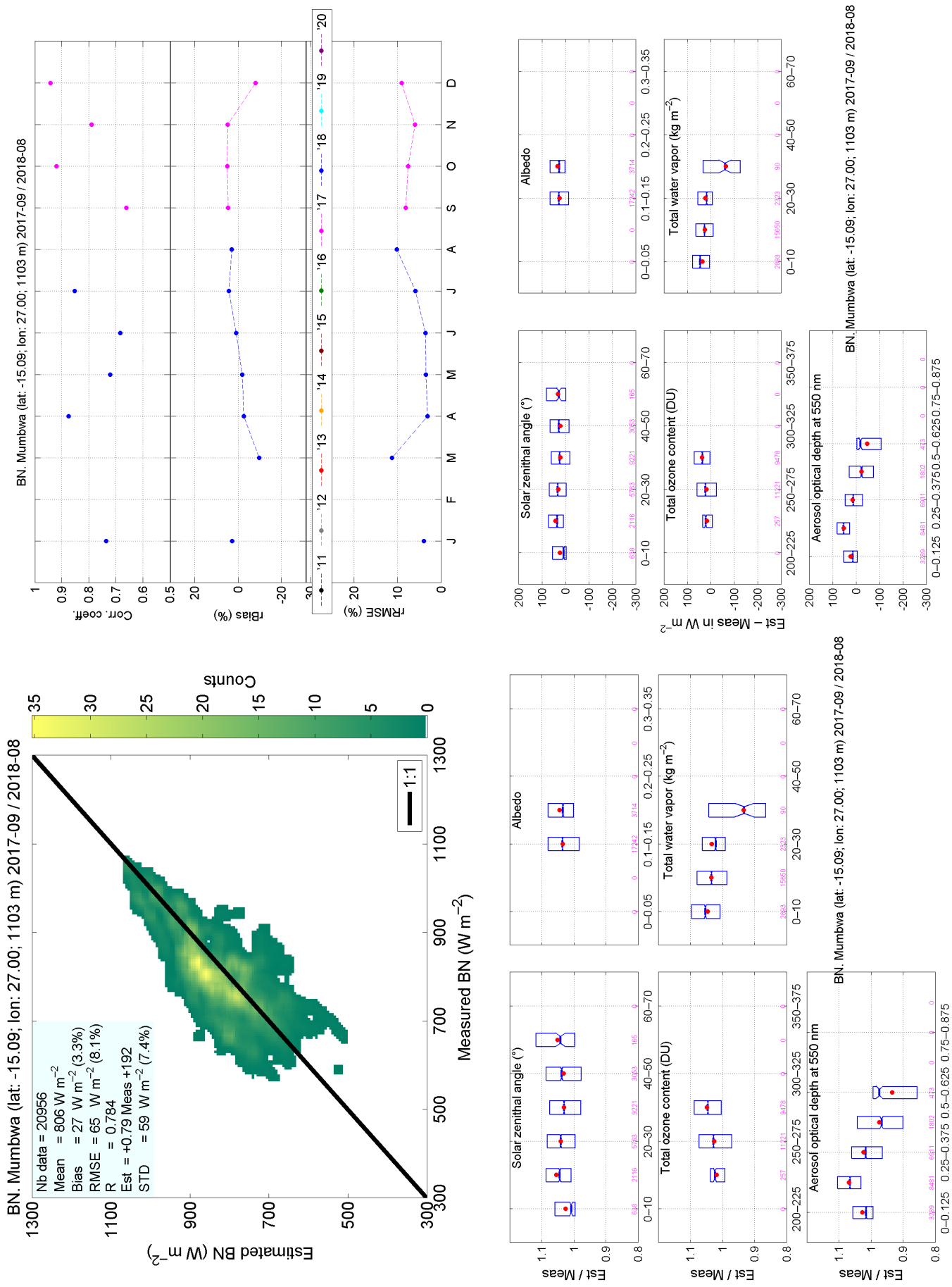
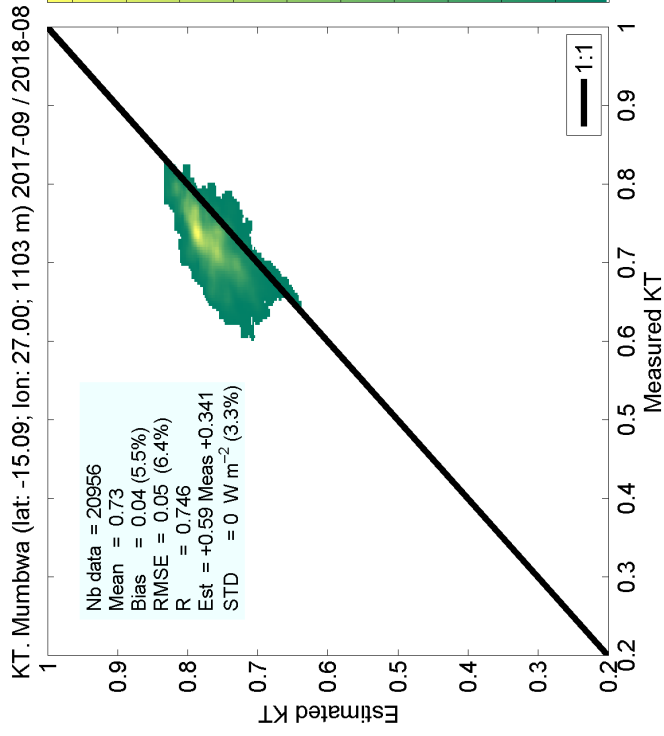


Figure S82: Comparison on direct component at normal irradiance at Mumbwa



KT. Mumbai (lat: -15.09; lon: 27.00; 1103 m) 2017-09 / 2018-08

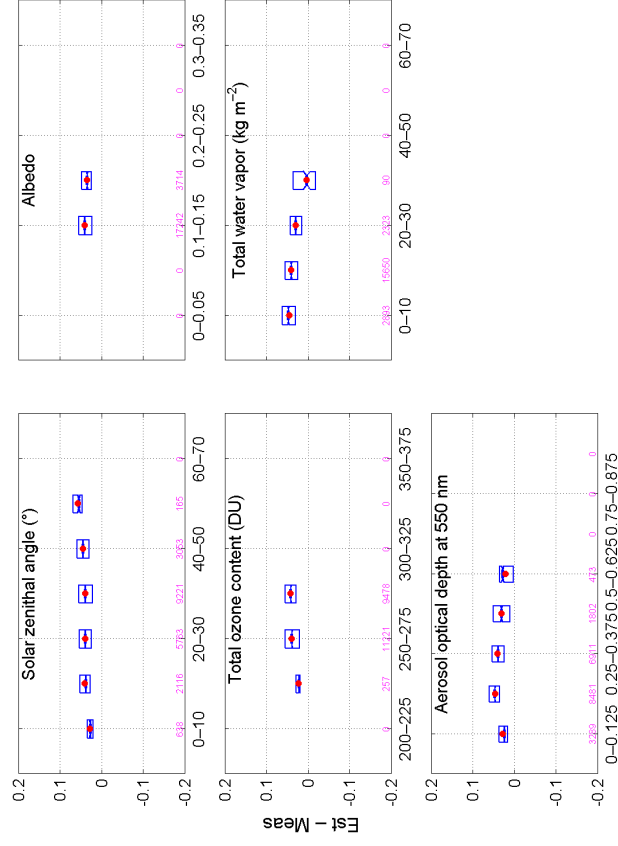
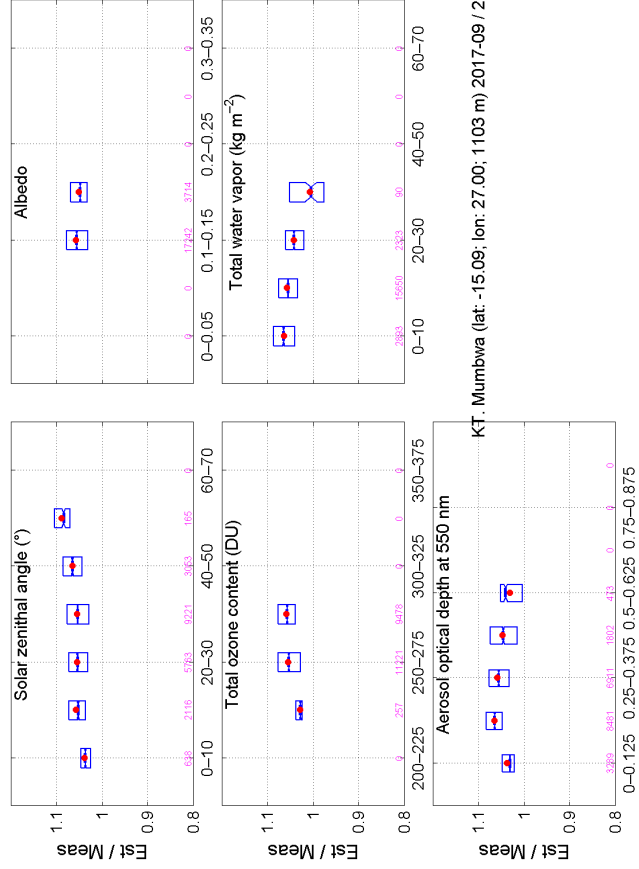
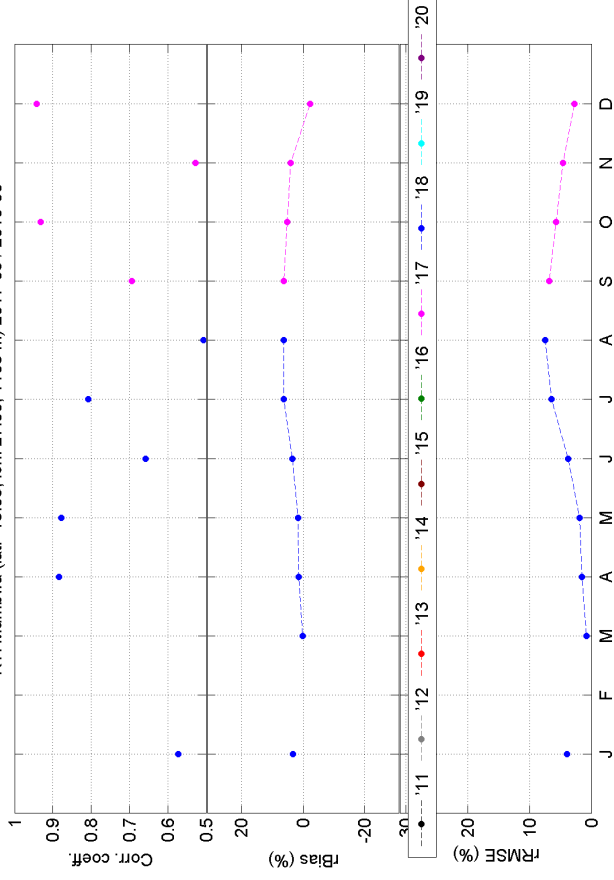


Figure S83: Comparison on clearness index at Mumbai

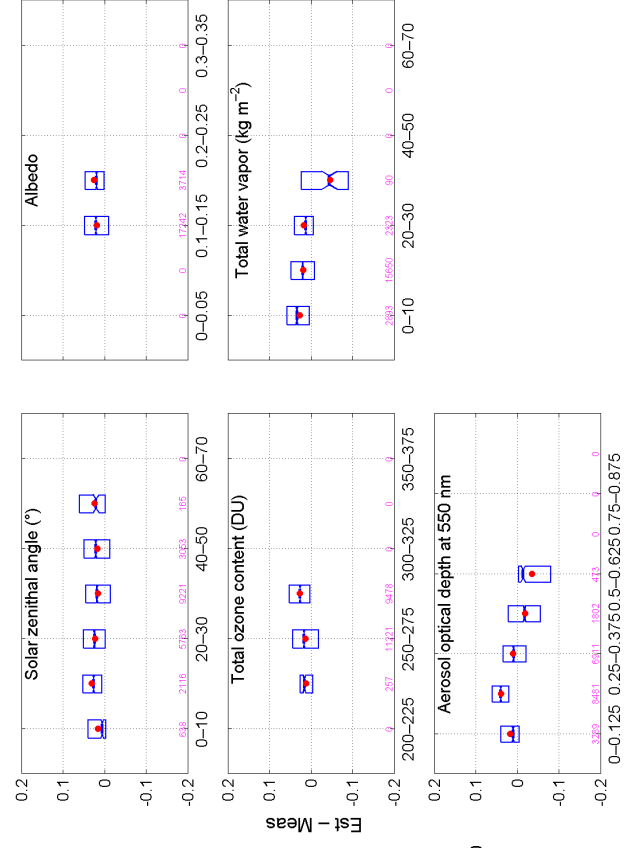
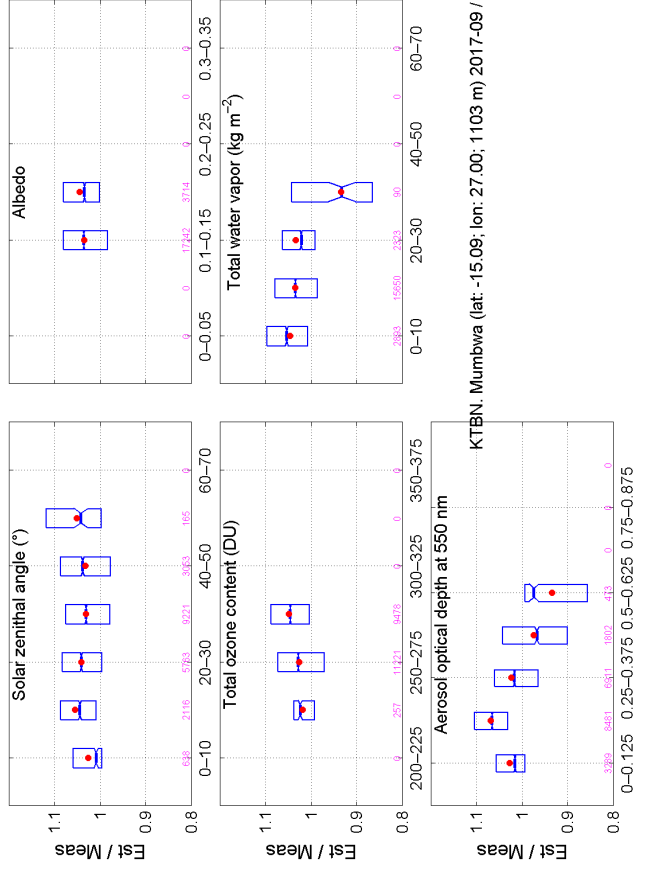
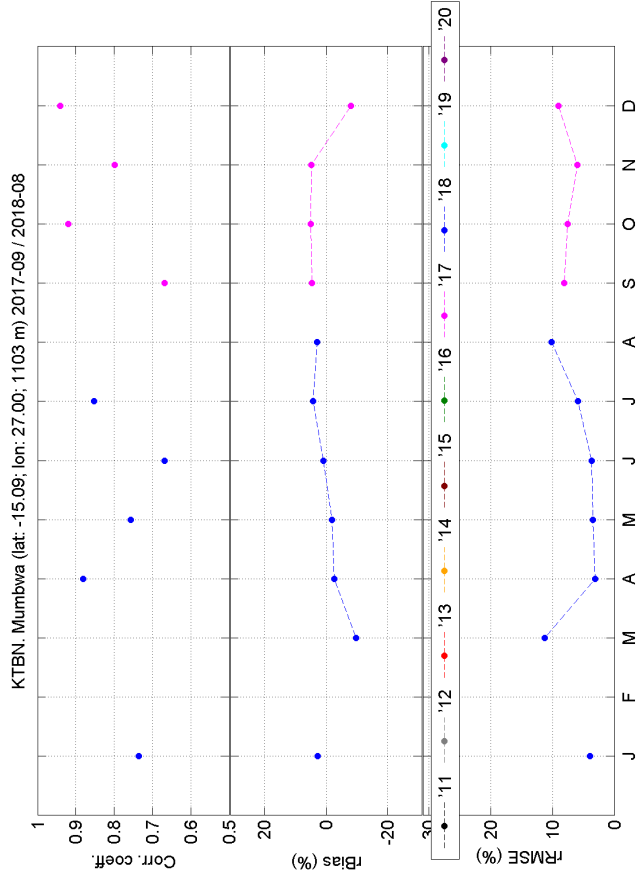
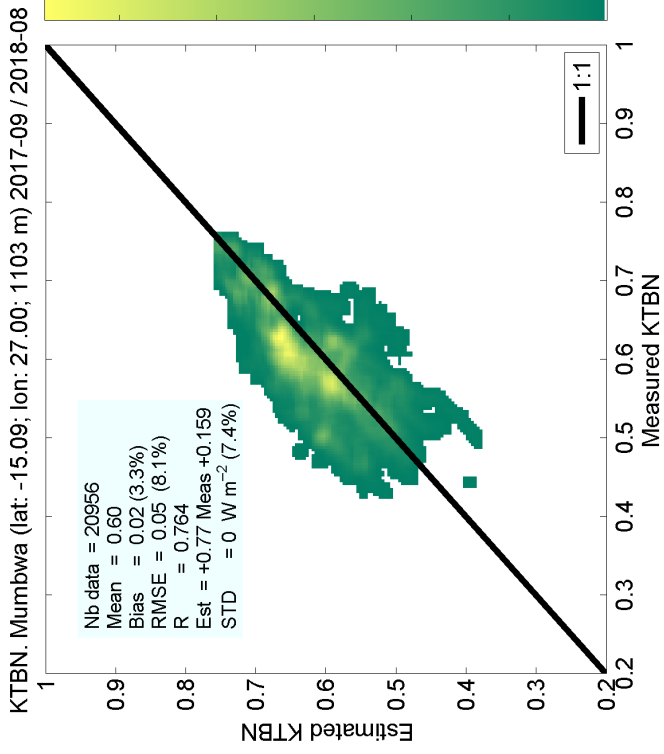


Figure S84: Comparison on direct clearness index at Mumbwa

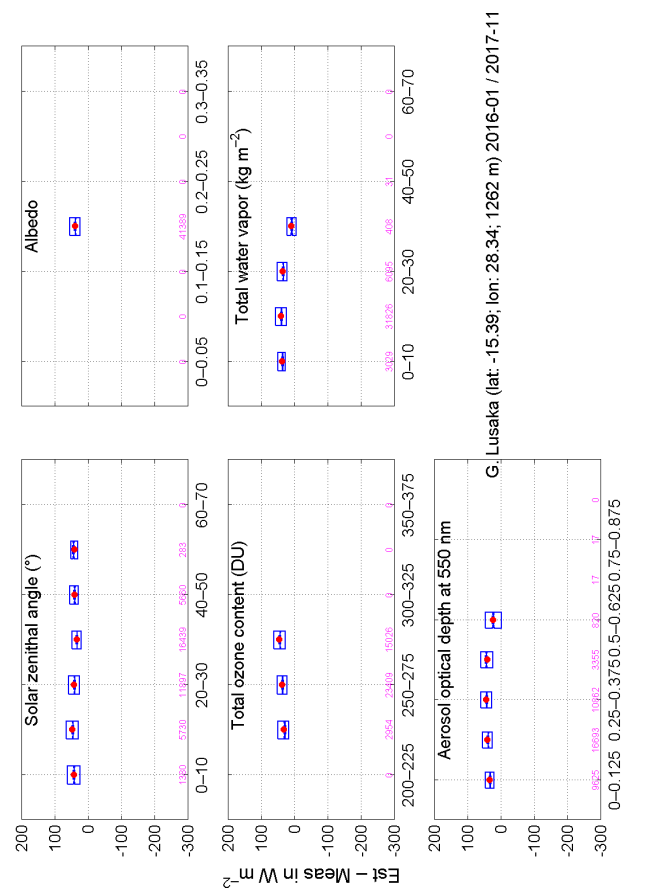
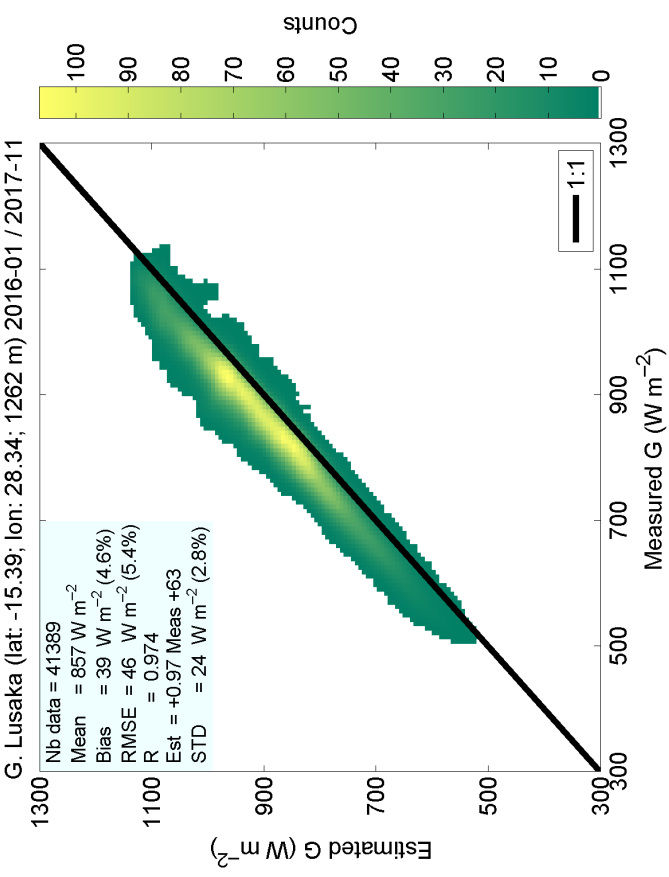
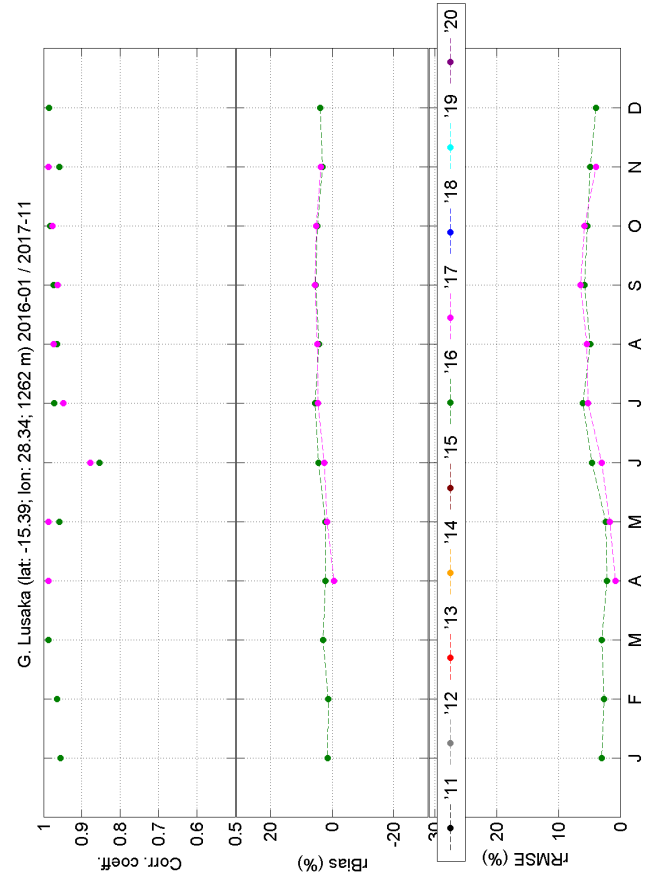


Figure S85: Comparison on global irradiance at Lusaka

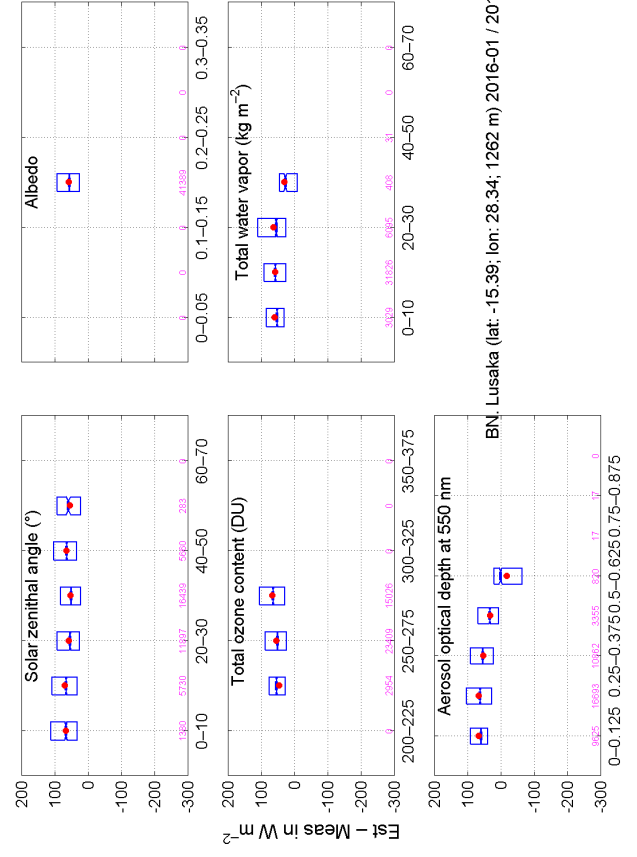
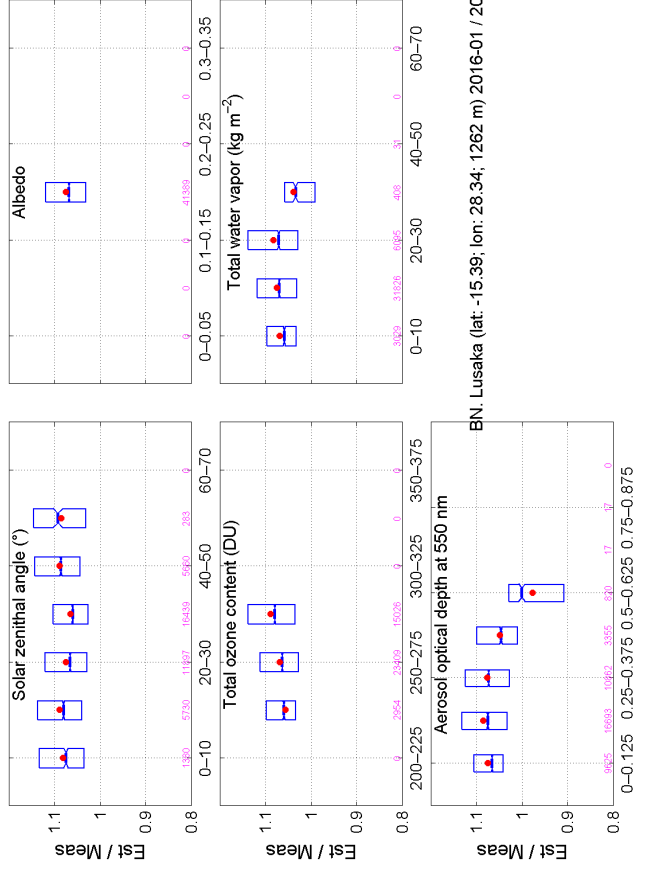
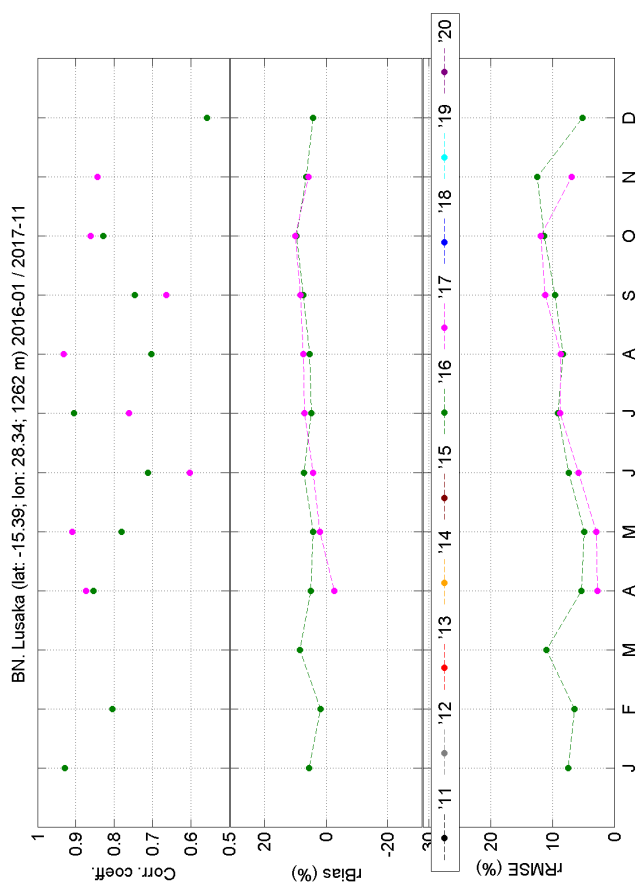
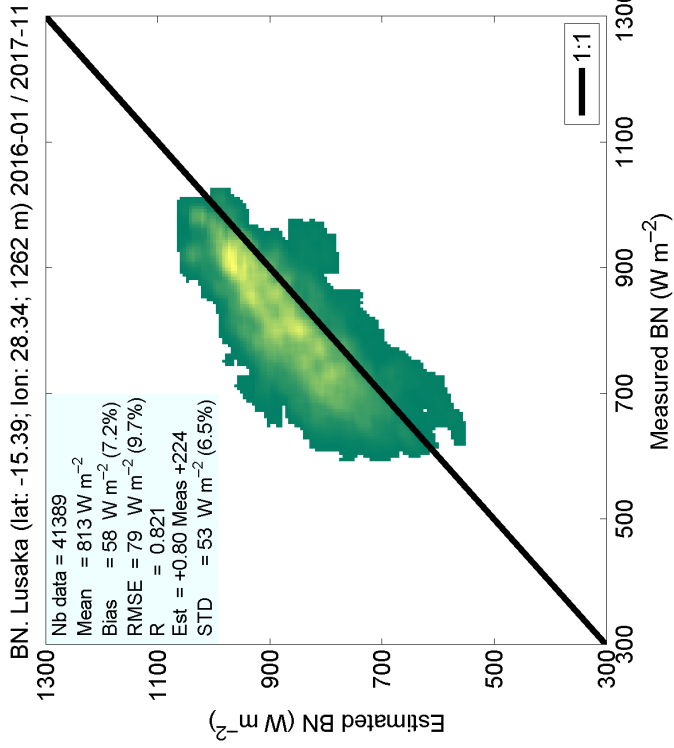
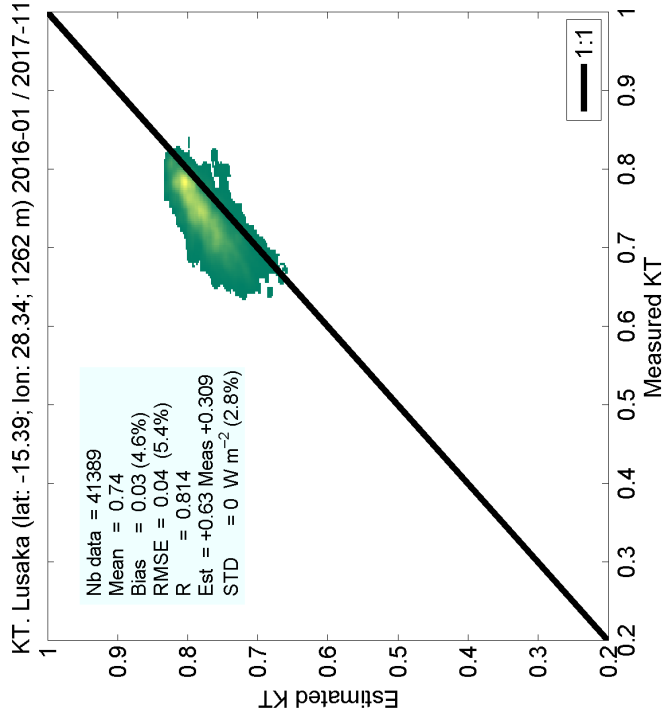


Figure S86: Comparison on direct component at normal irradiance at Lusaka



KT. Lusaka (lat: -15.39; lon: 28.34; 1262 m) 2016-01 / 2017-11

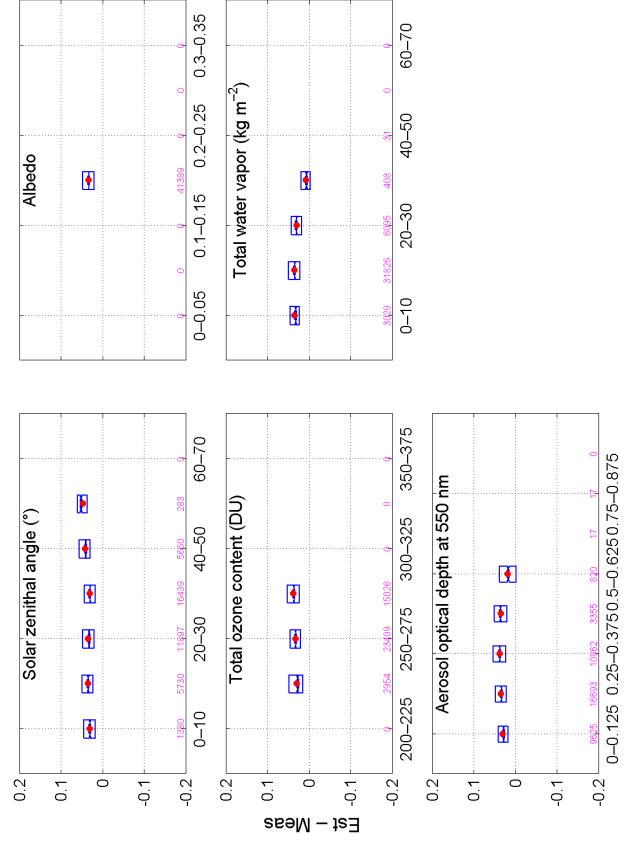
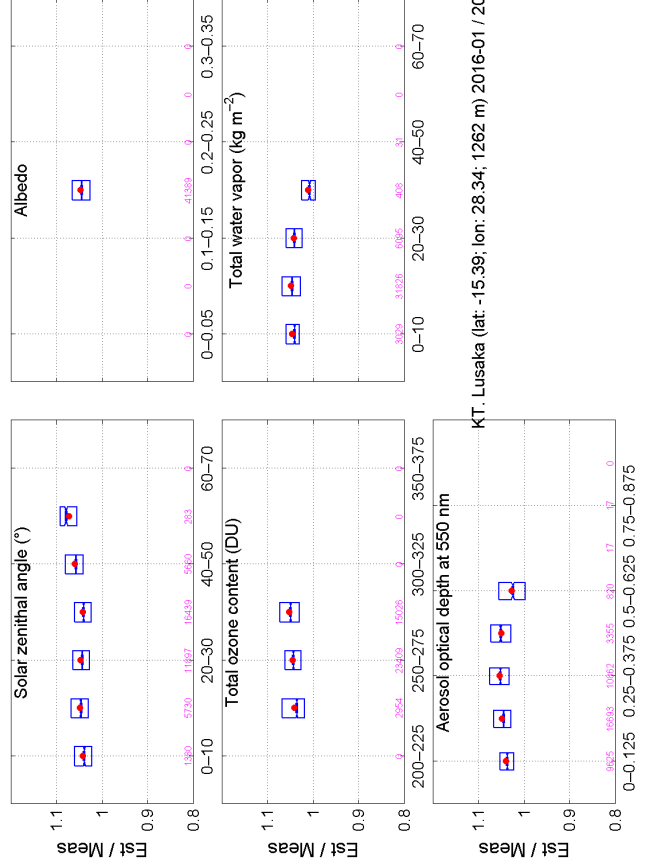
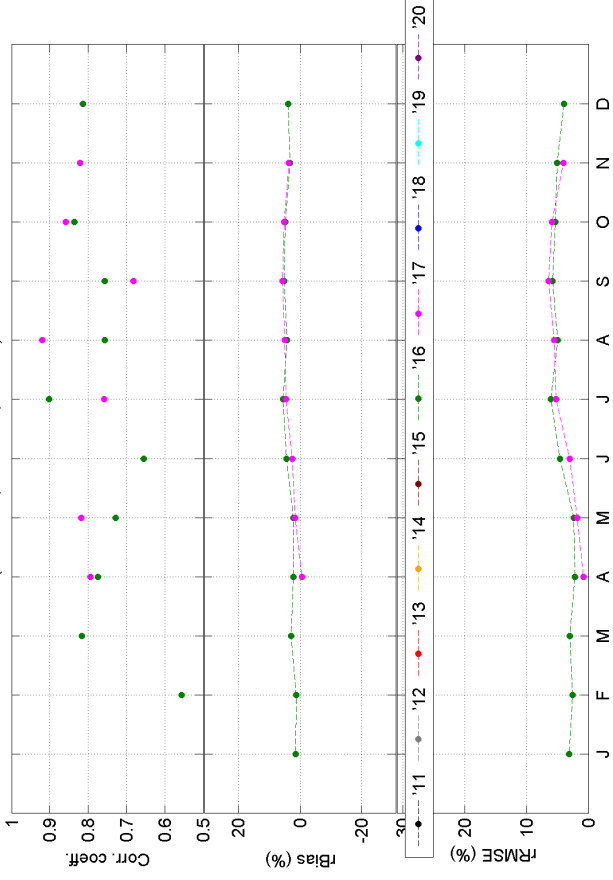


Figure S87: Comparison on clearness index at Lusaka

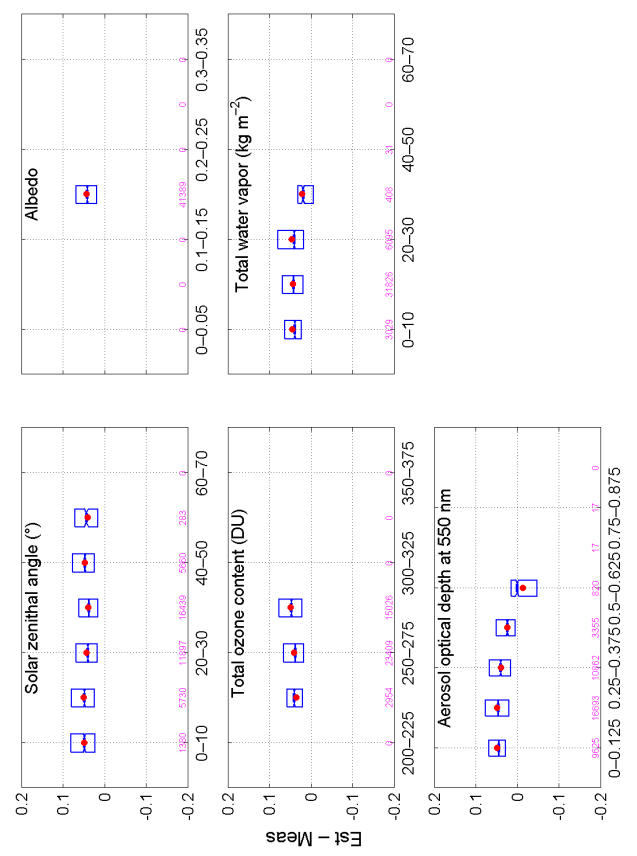
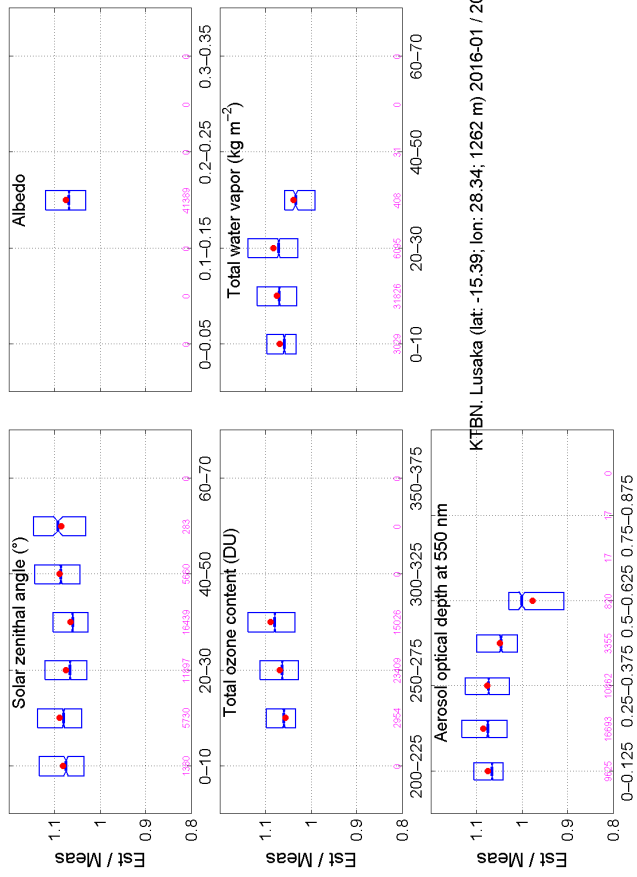
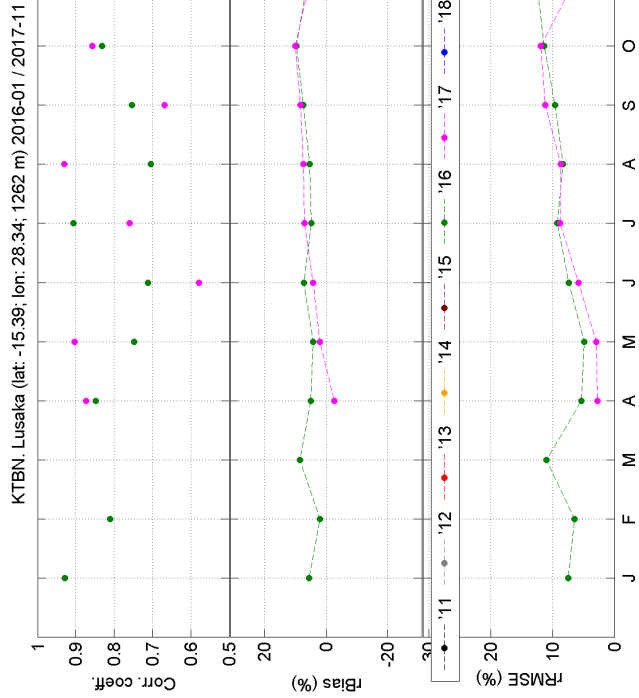
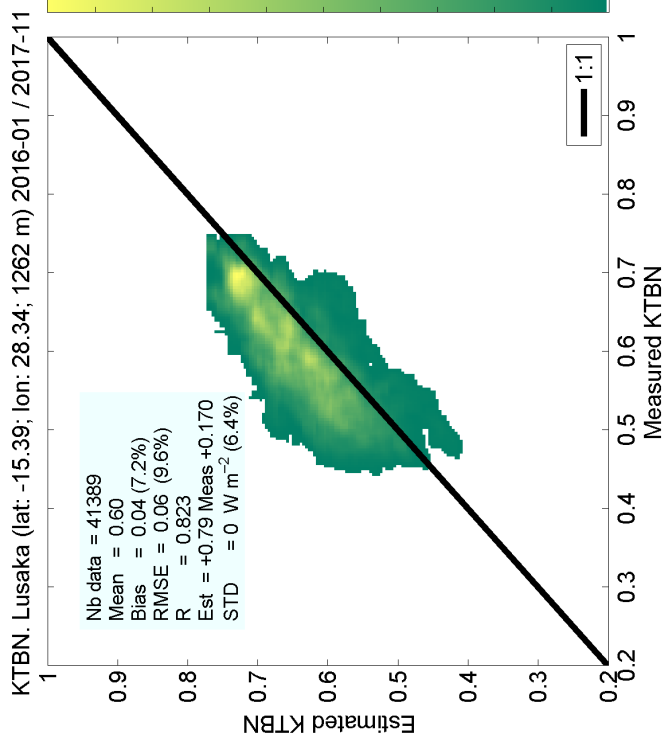
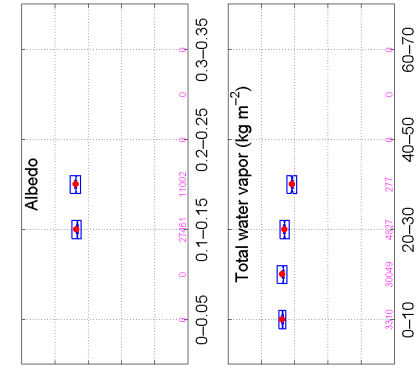
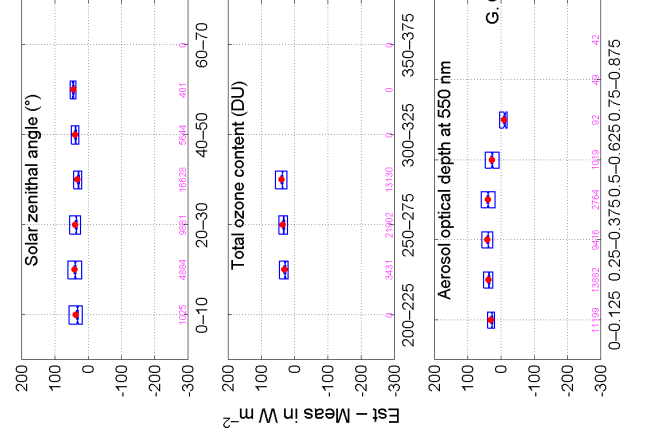
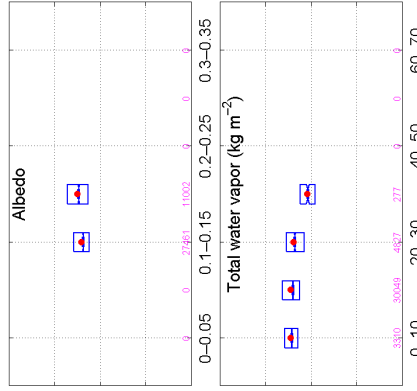
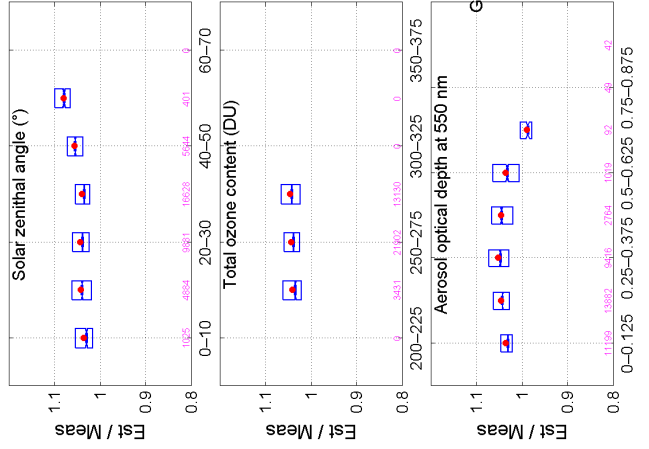
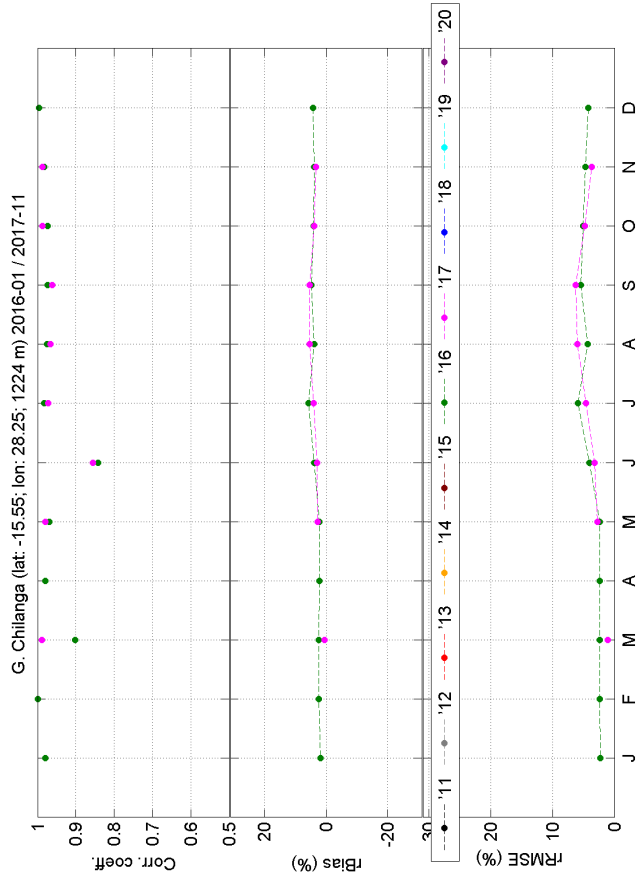
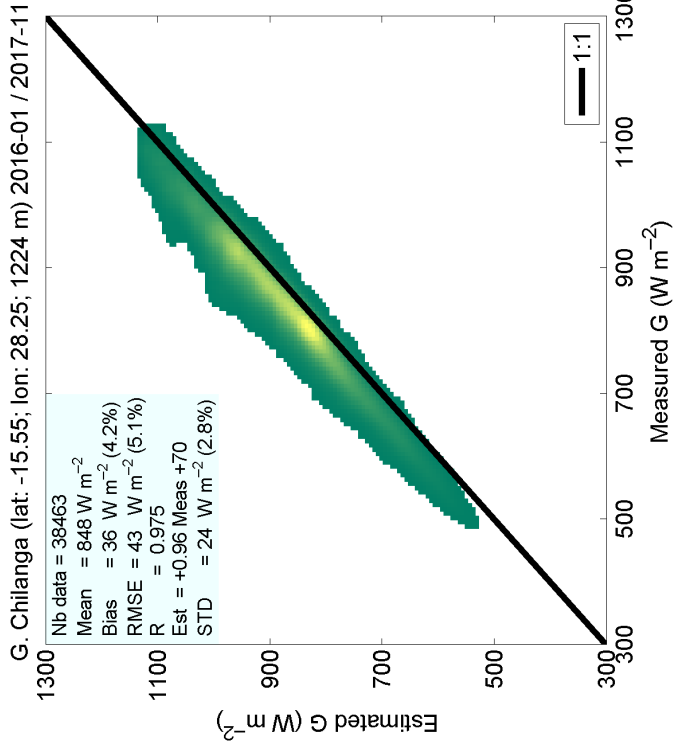


Figure S88: Comparison on direct clearness index at Lusaka



G. Chilianga (lat: -15.55; lon: 28.25; 1224 m) 2016-01 / 2017-11

G. Chilianga (lat: -15.55; lon: 28.25; 1224 m) 2016-01 / 2017-11

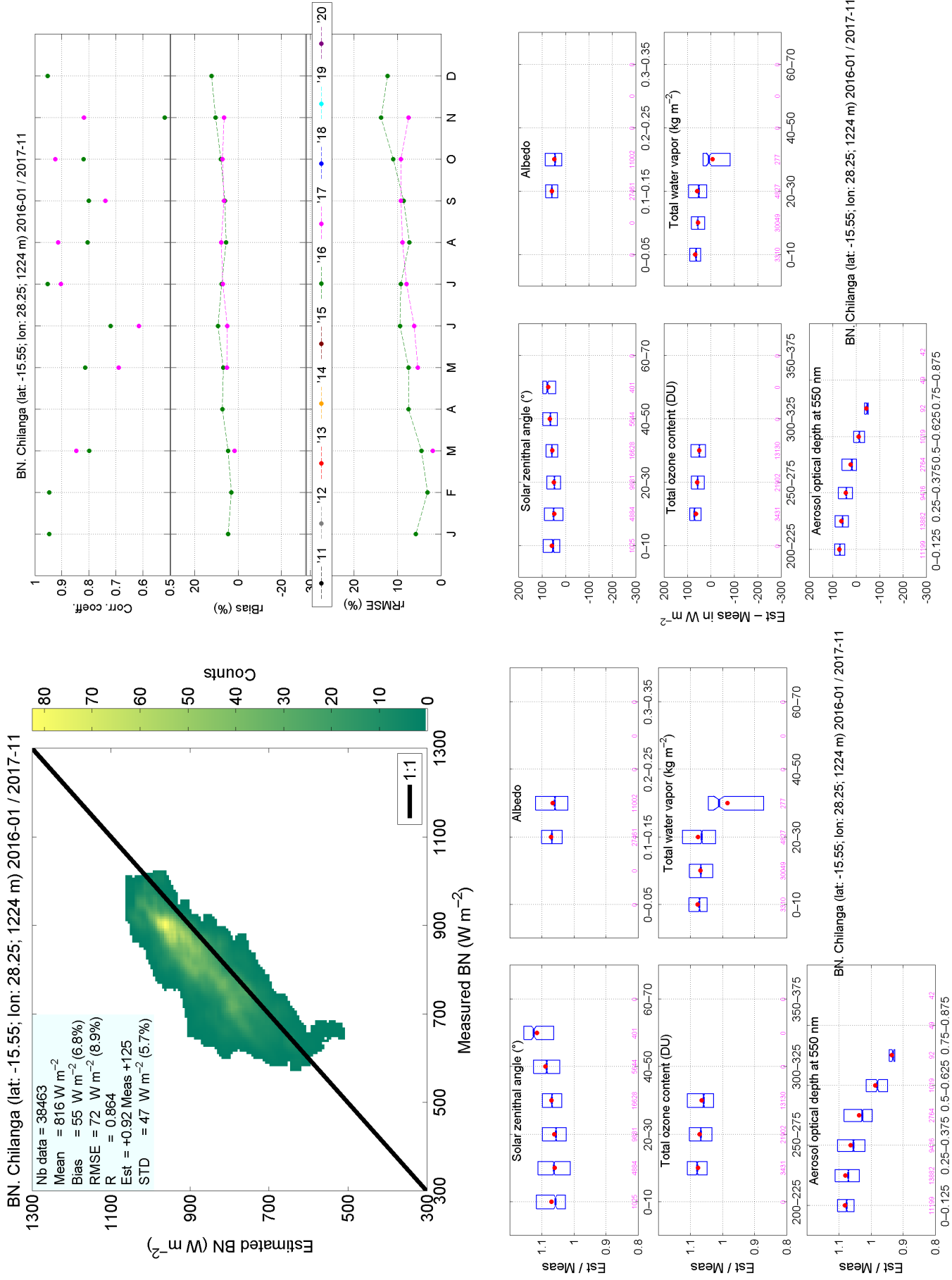
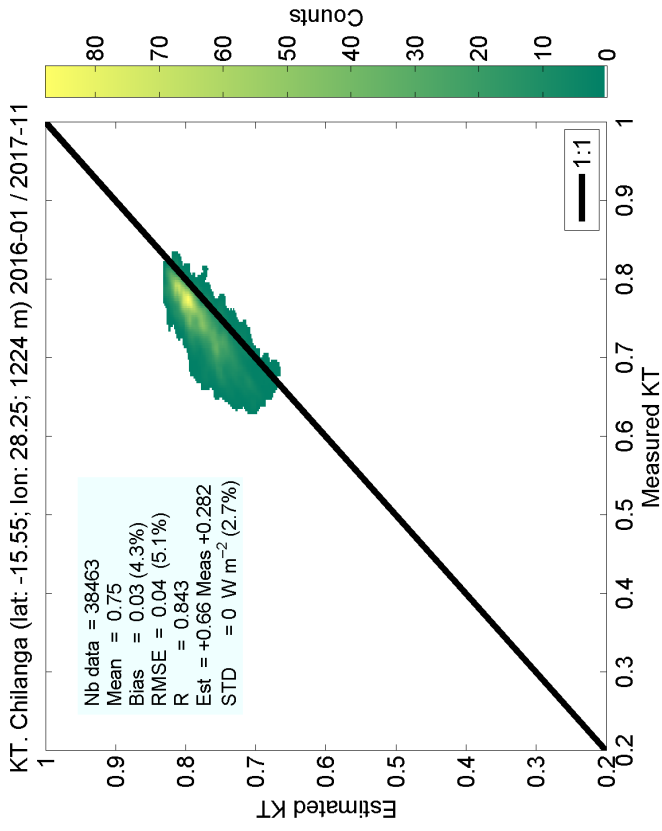


Figure S90: Comparison on direct component at normal irradiance at Chilanga



KT. Chilanga (lat: -15.55; lon: 28.25; 1224 m) 2016-01 / 2017-11

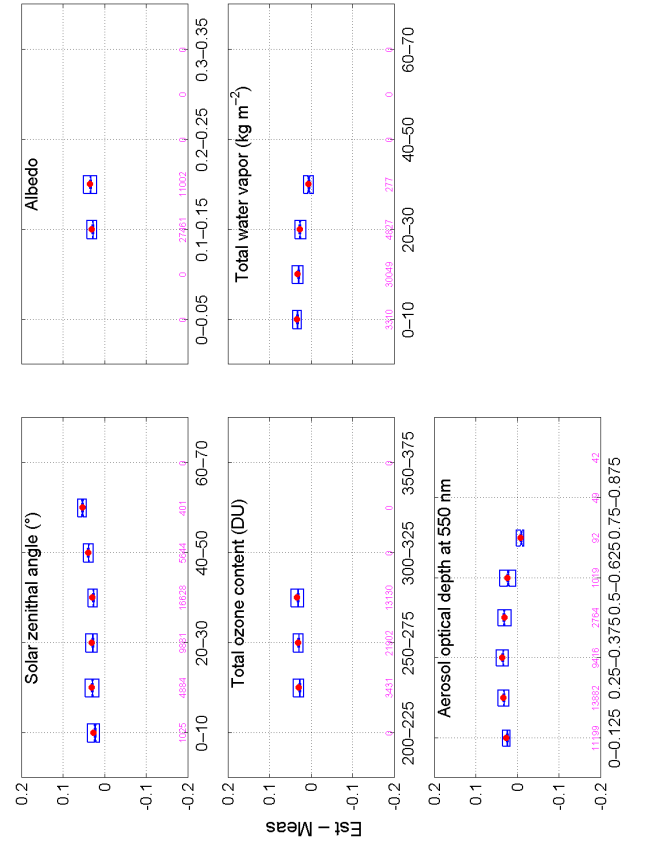
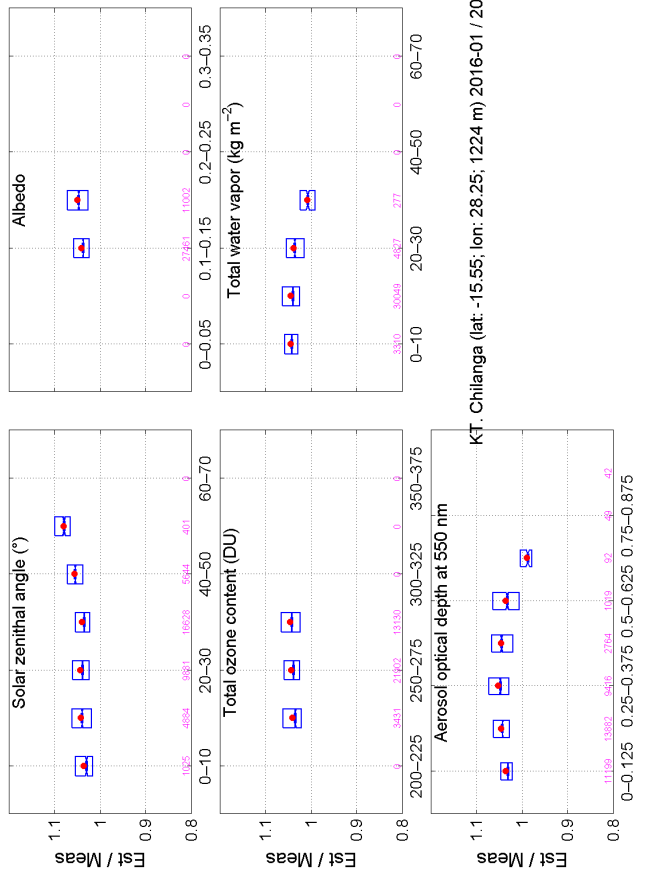
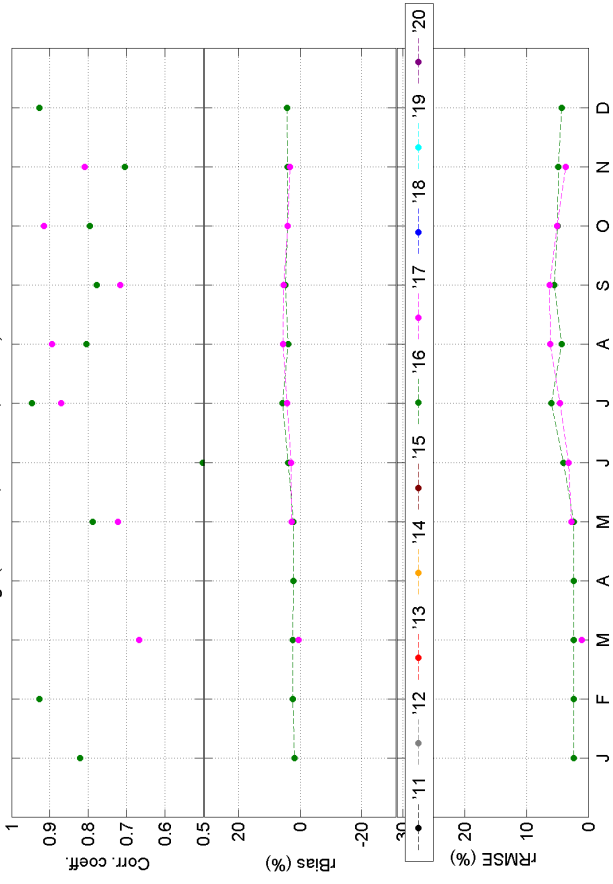


Figure S91: Comparison on clearness index at Chilanga

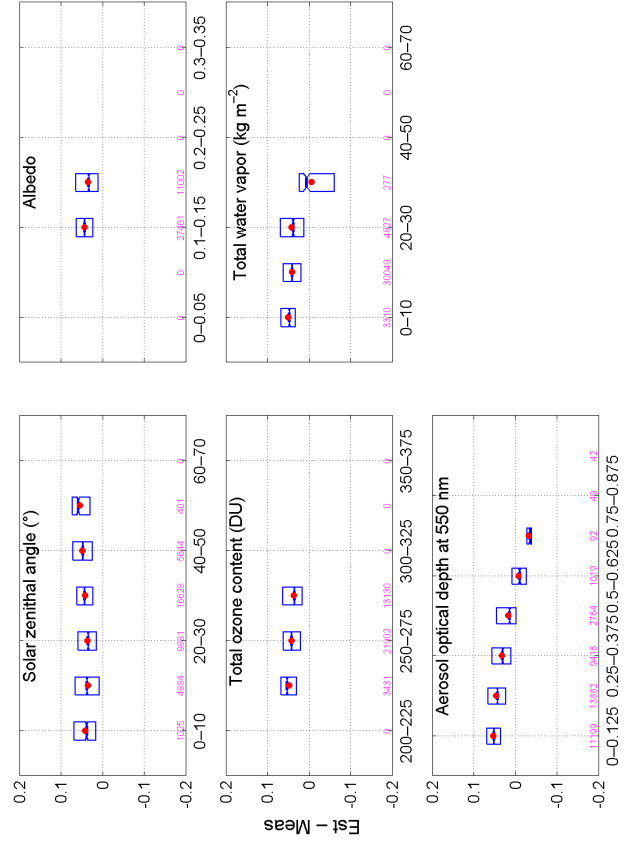
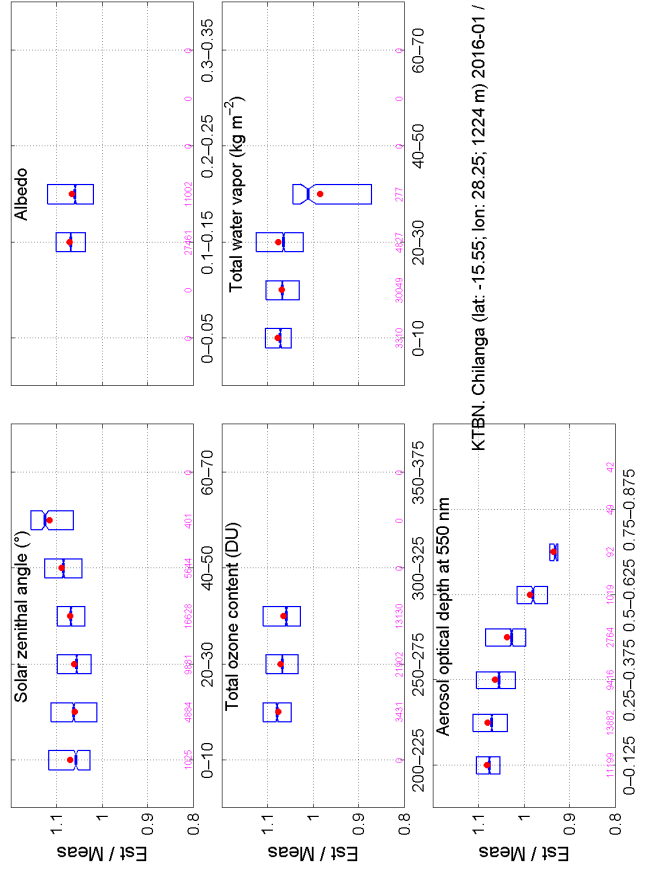
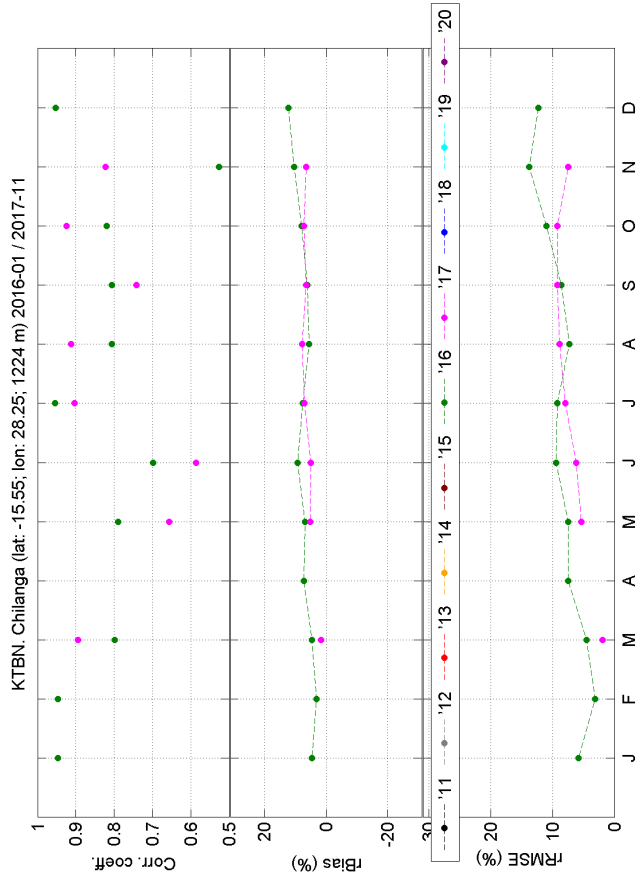
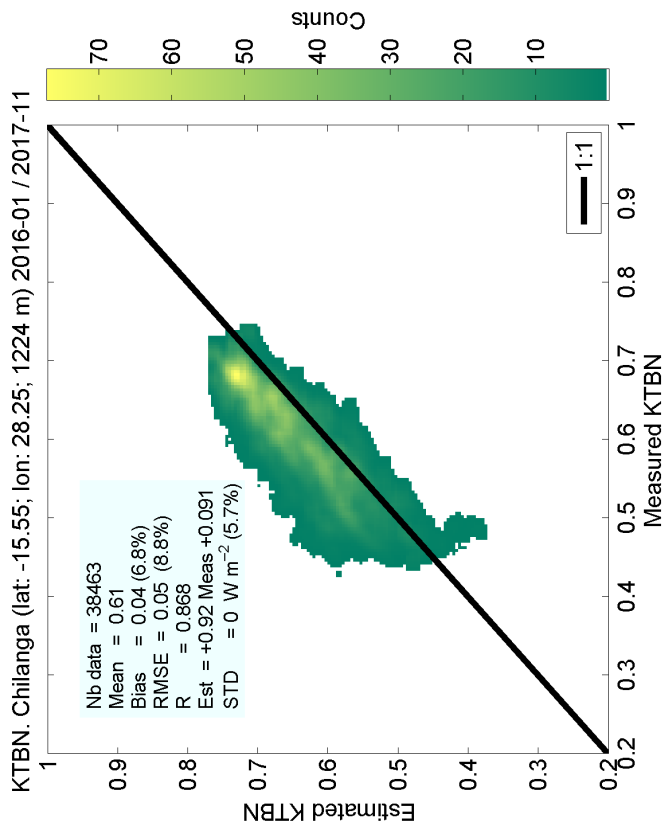
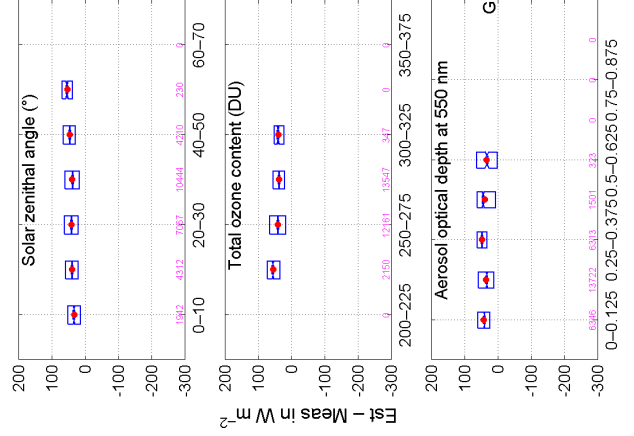
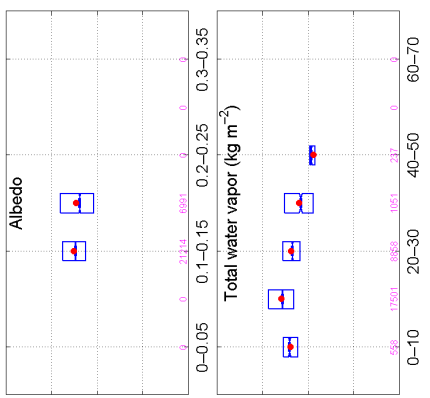
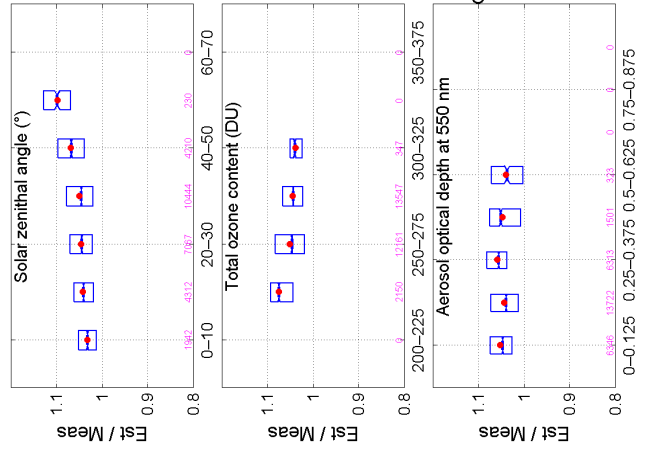
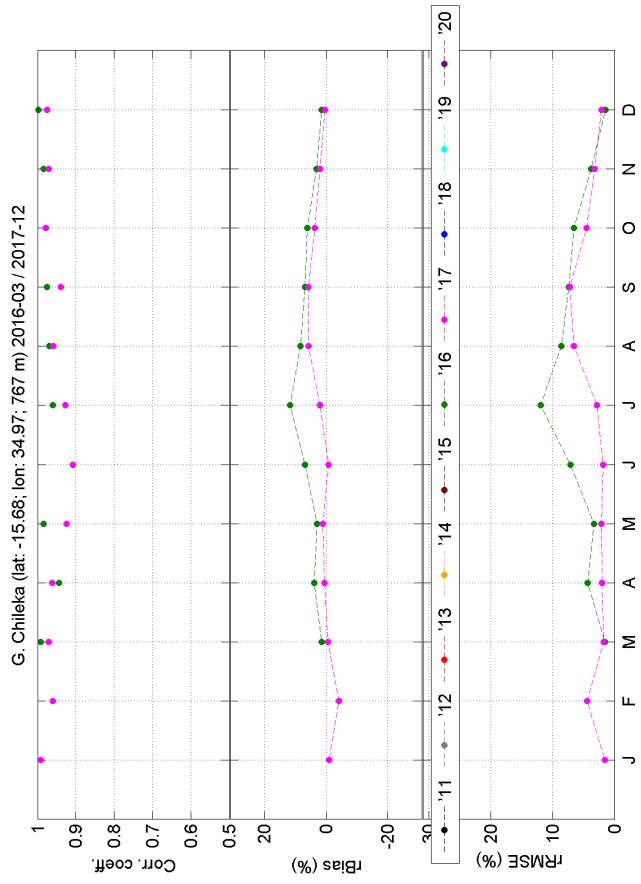
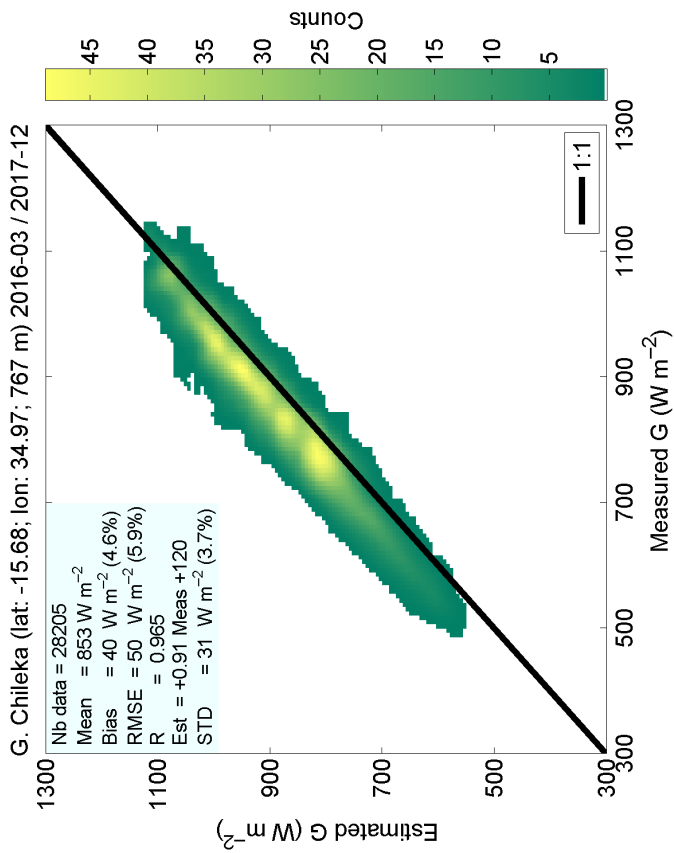


Figure S92: Comparison on direct clearness index at Chilanga



G. Chileka (lat: -15.68; lon: 34.97; 767 m) 2016-03 / 2017-12

Figure S93: Comparison on global irradiance at Chileka

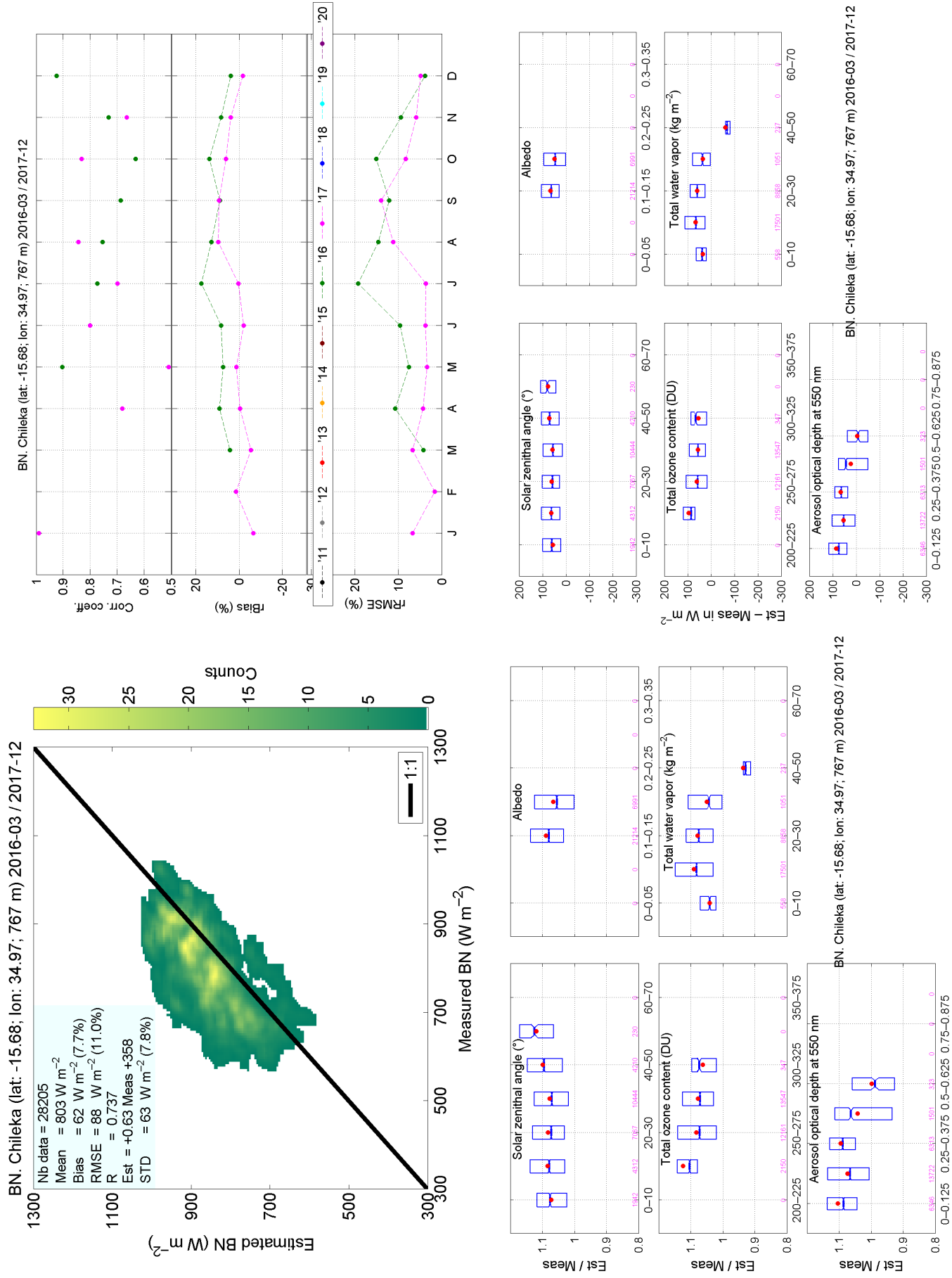
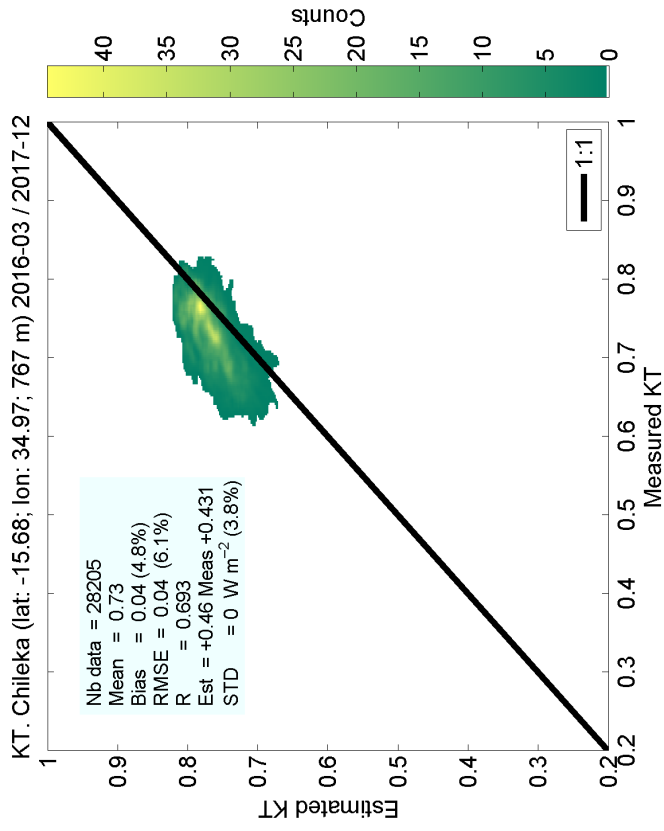
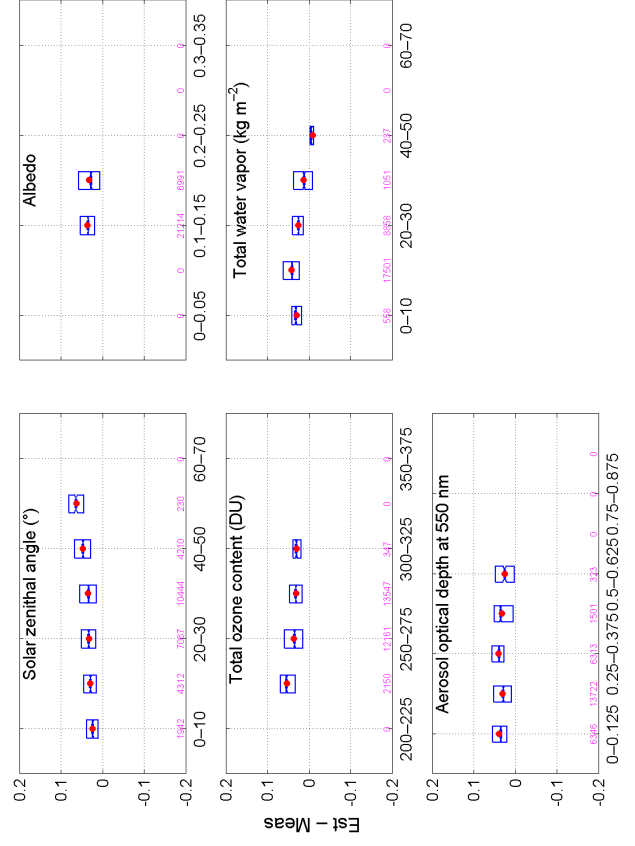
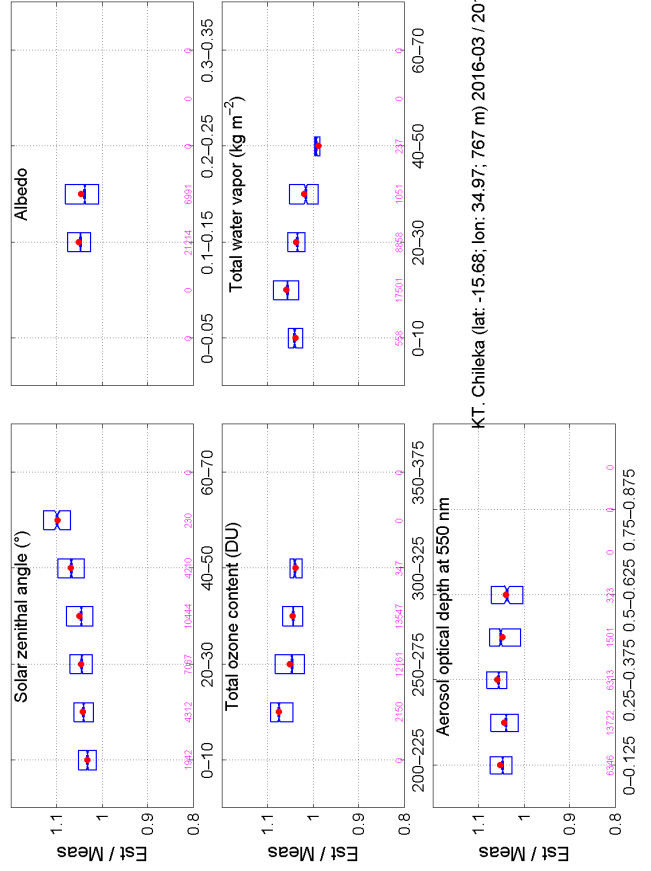
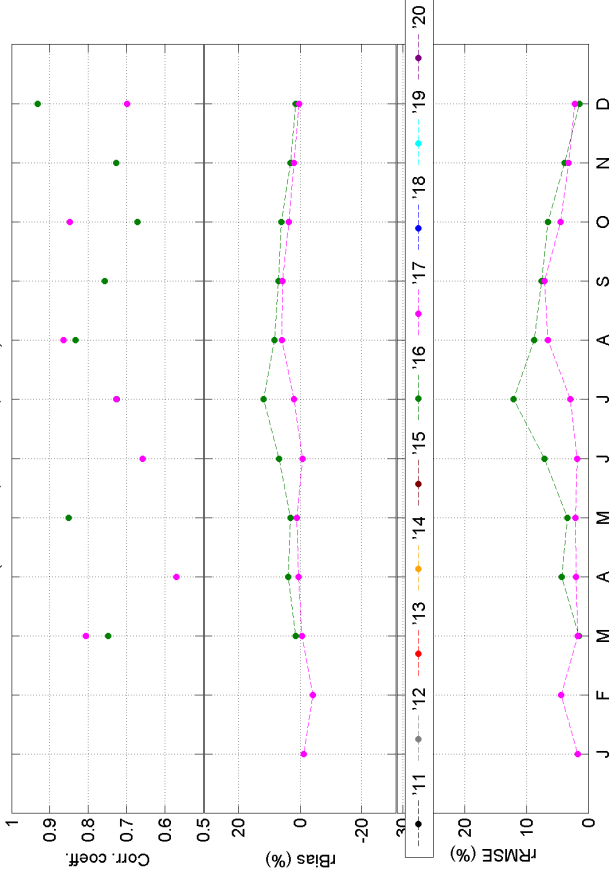
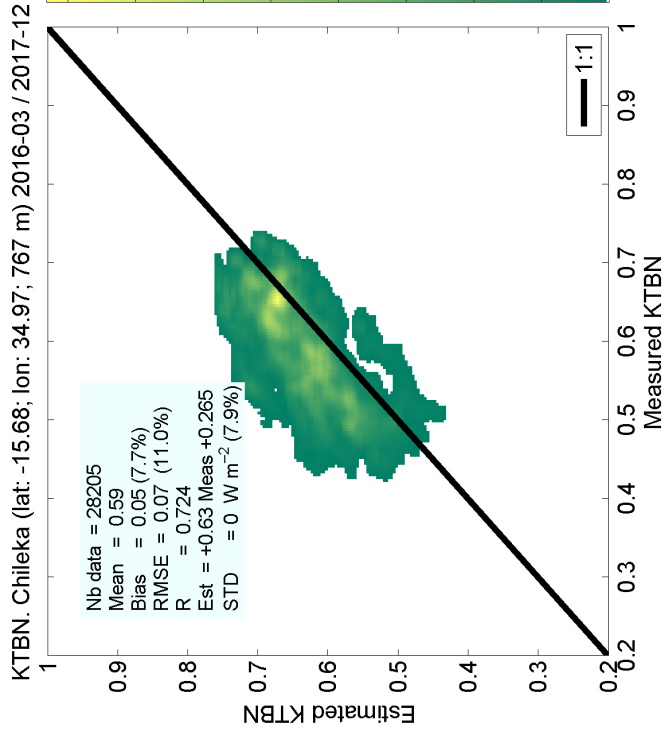


Figure S94: Comparison on direct component at normal irradiance at Chileka



KT, Chileka (lat: -15.68; lon: 34.97; 767 m) 2016-03 / 2017-12





KTBN, Chileka (lat: -15.68; lon: 34.97; 767 m) 2016-03 / 2017-12

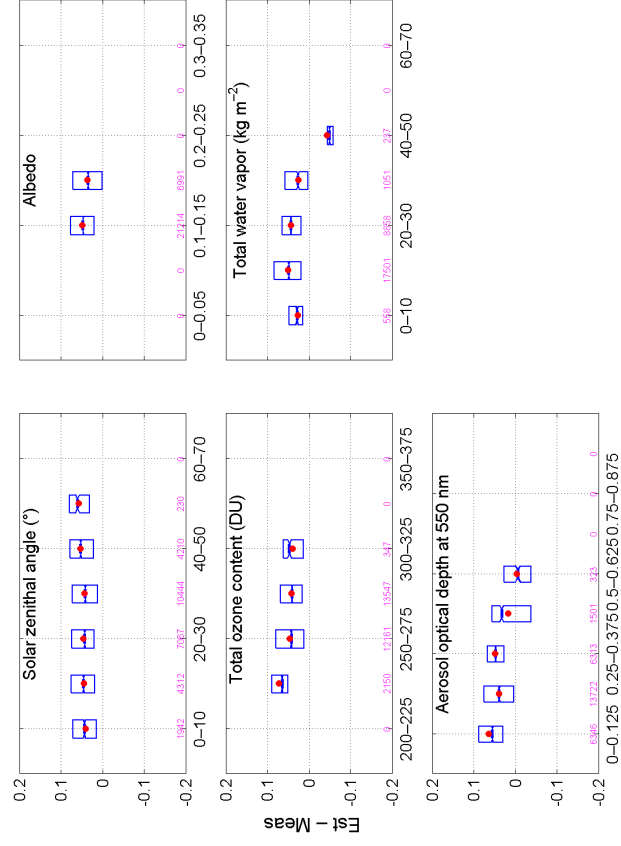
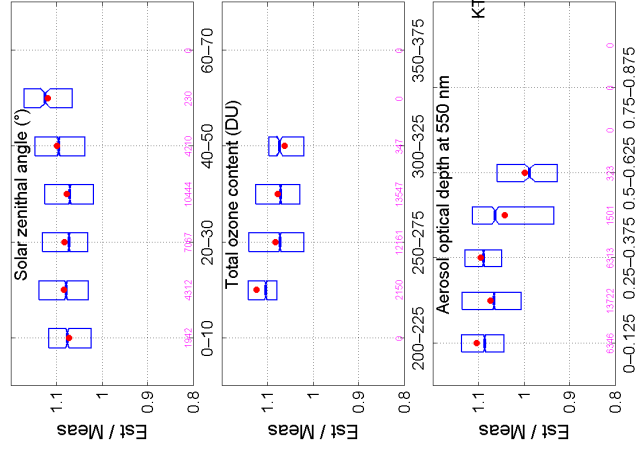
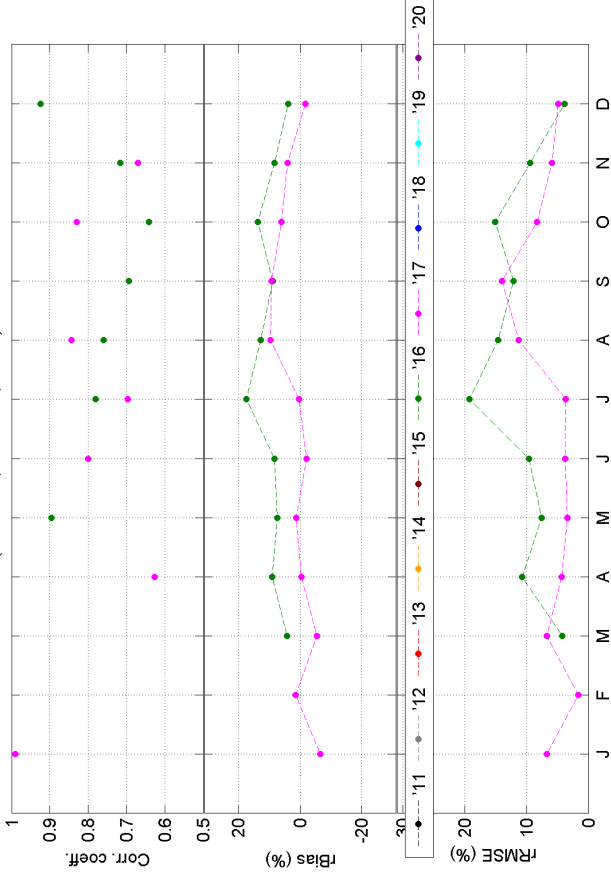


Figure S96: Comparison on direct clearness index at Chileka

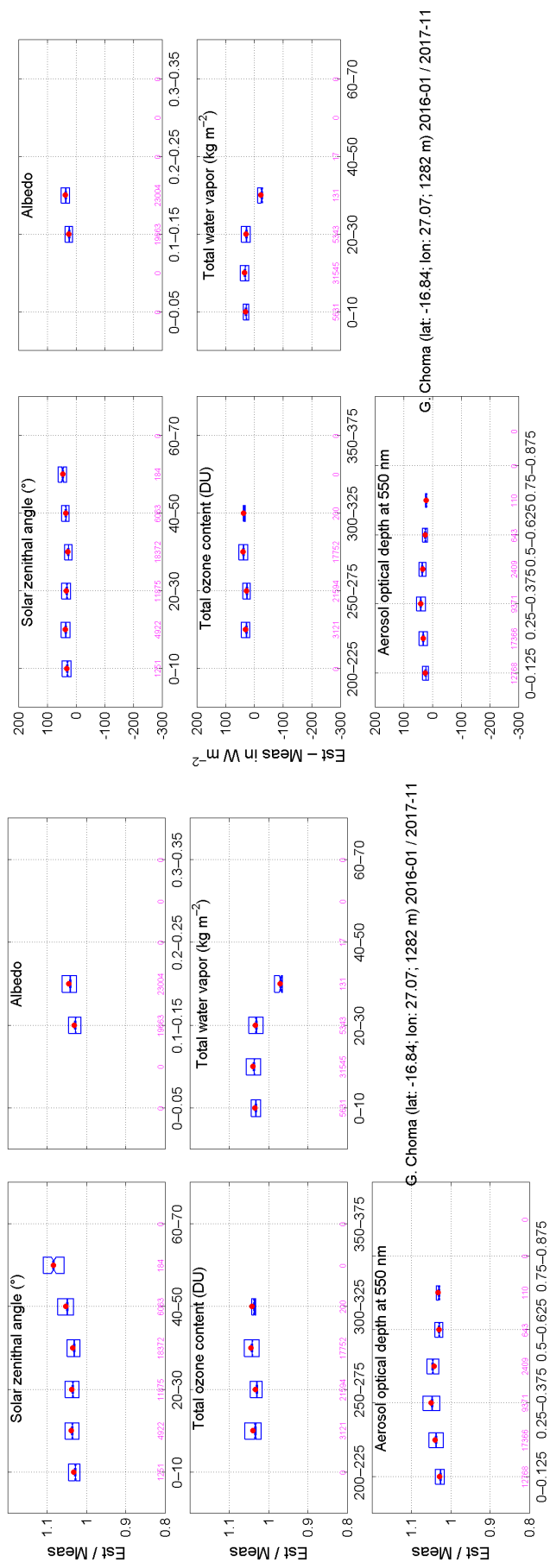
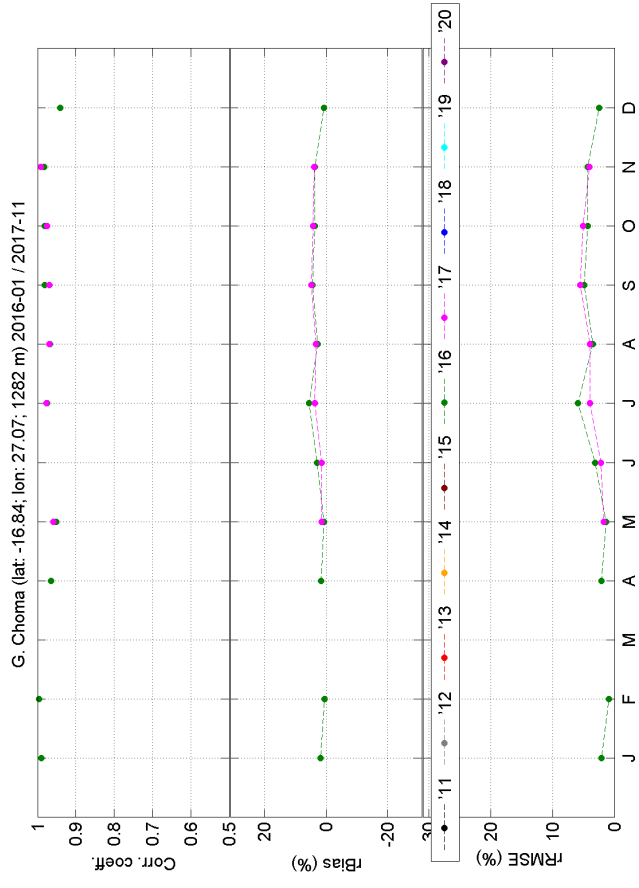
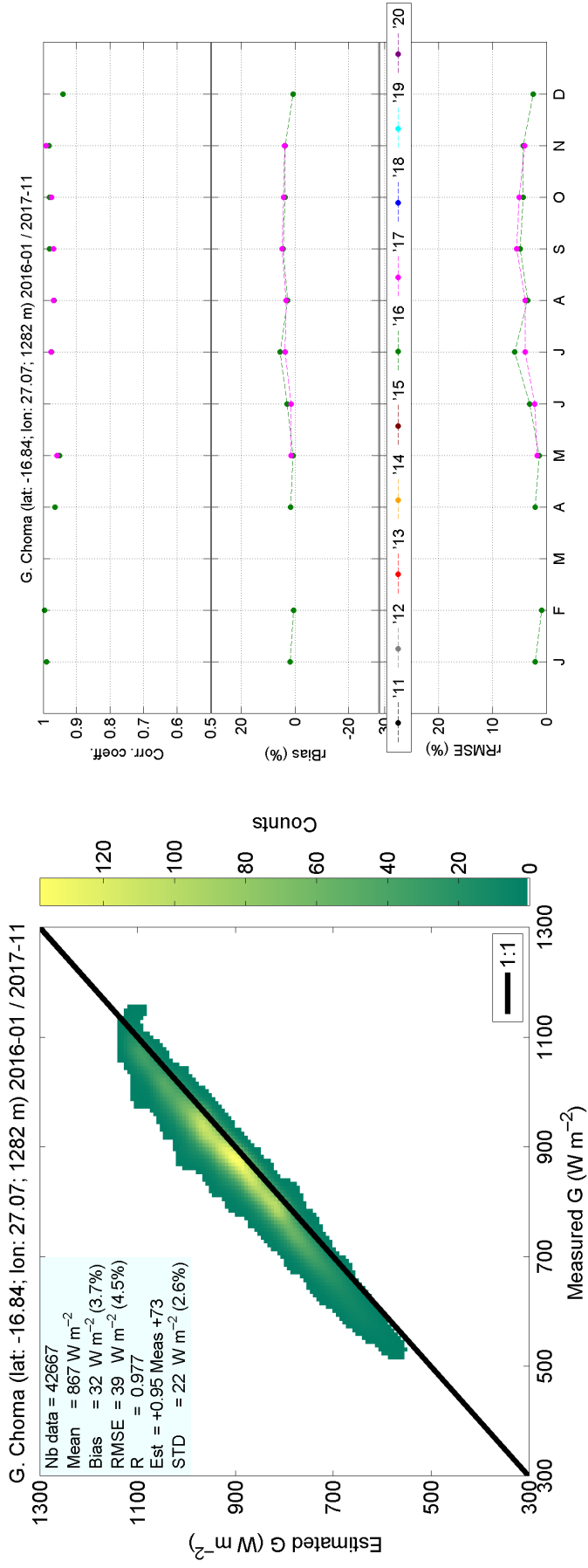


Figure S97: Comparison on global irradiance at Choma

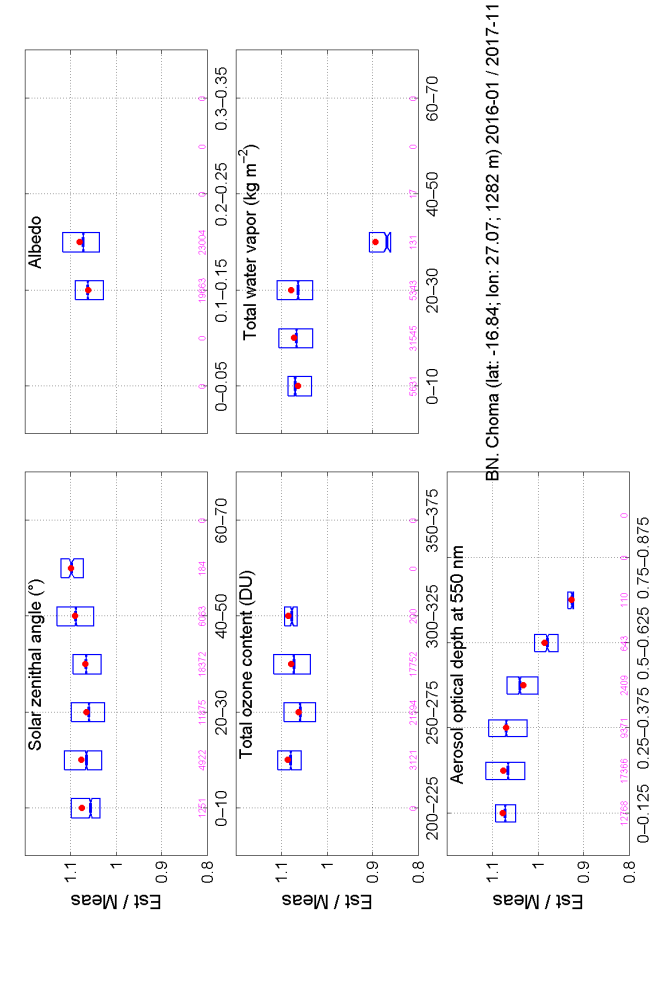
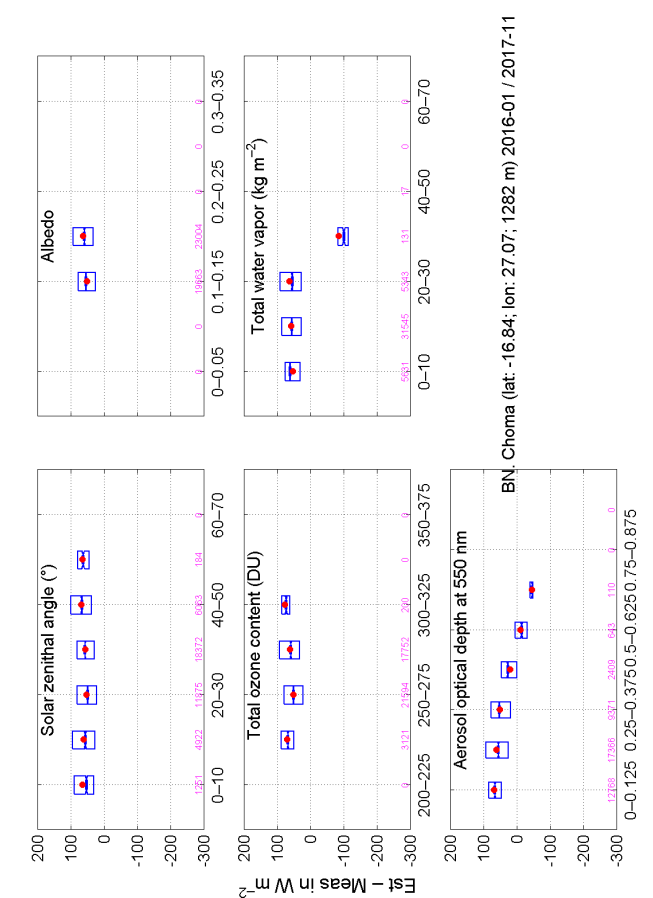
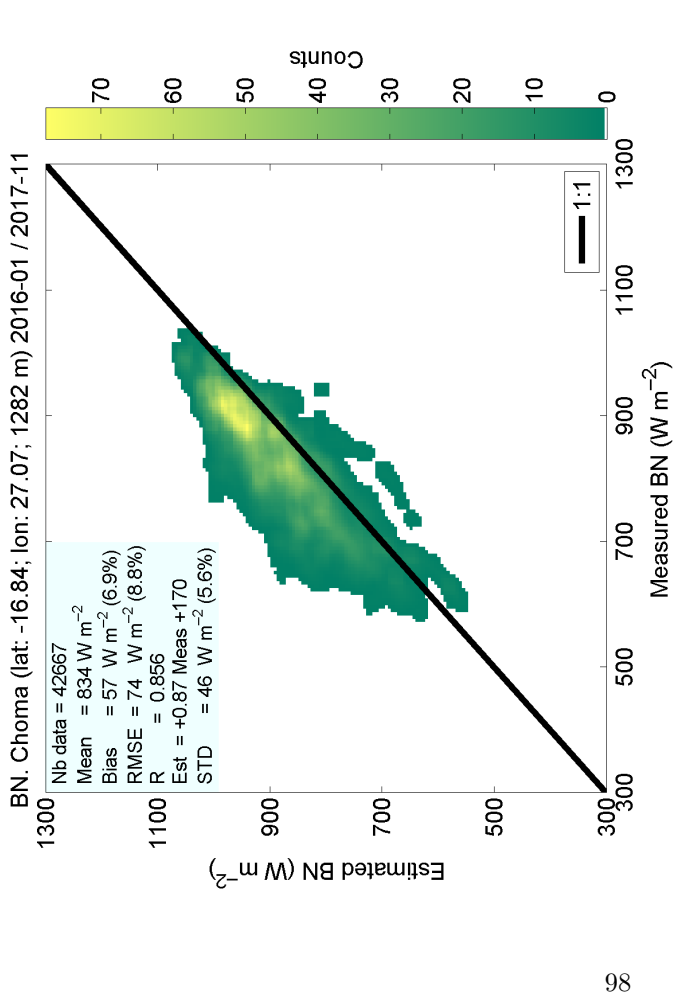
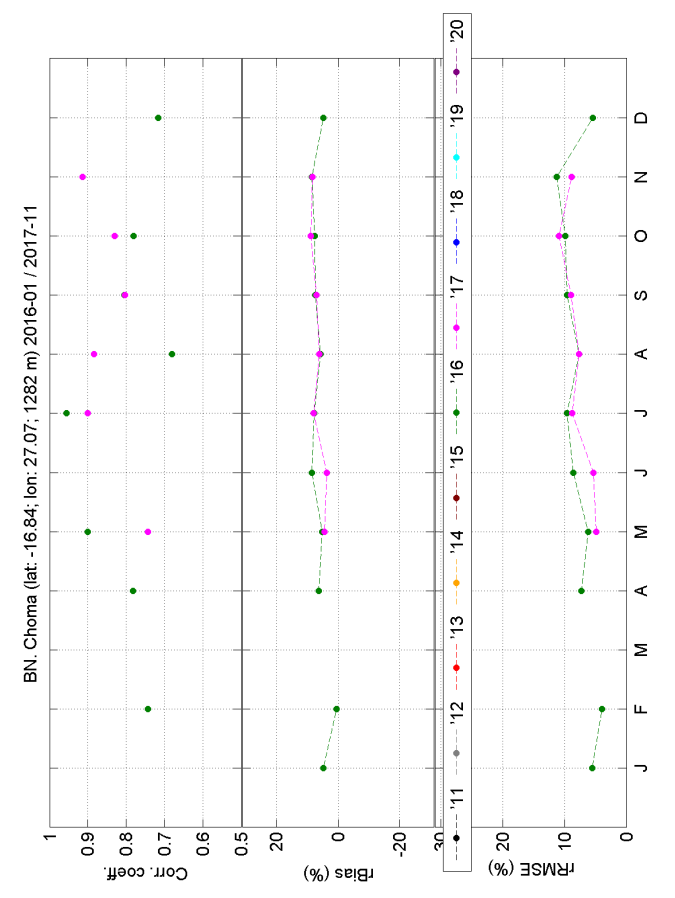
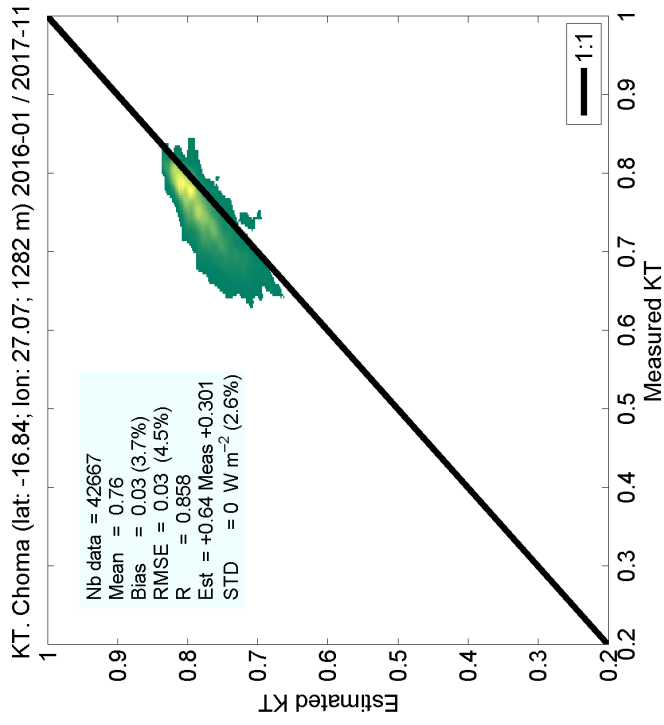


Figure S98: Comparison on direct component at normal irradiance at Choma



KT. Choma (lat: -16.84; lon: 27.07; 1282 m) 2016-01 / 2017-11

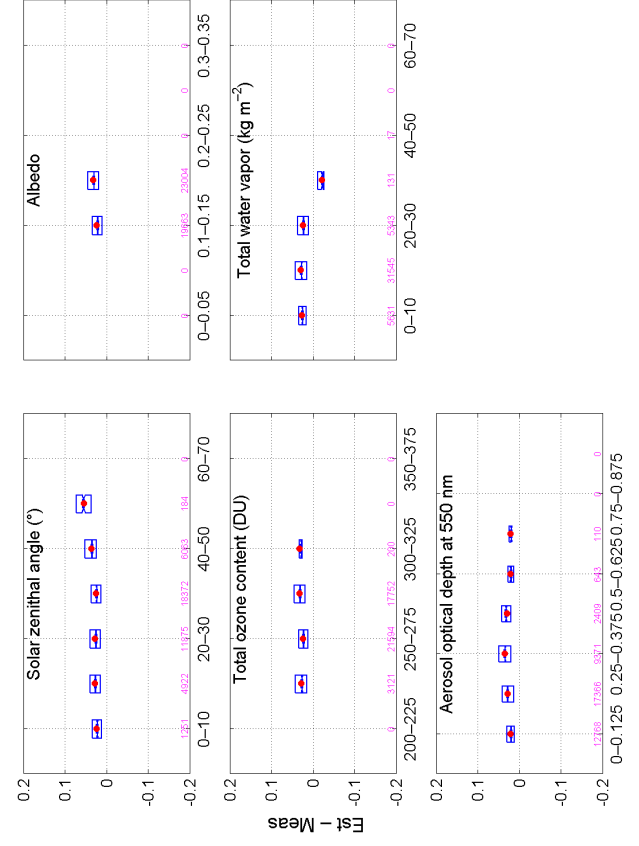
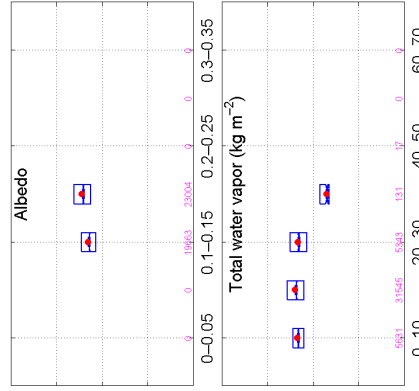
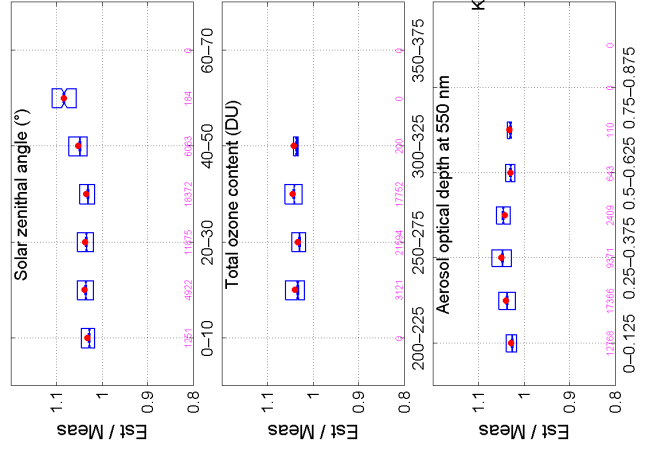
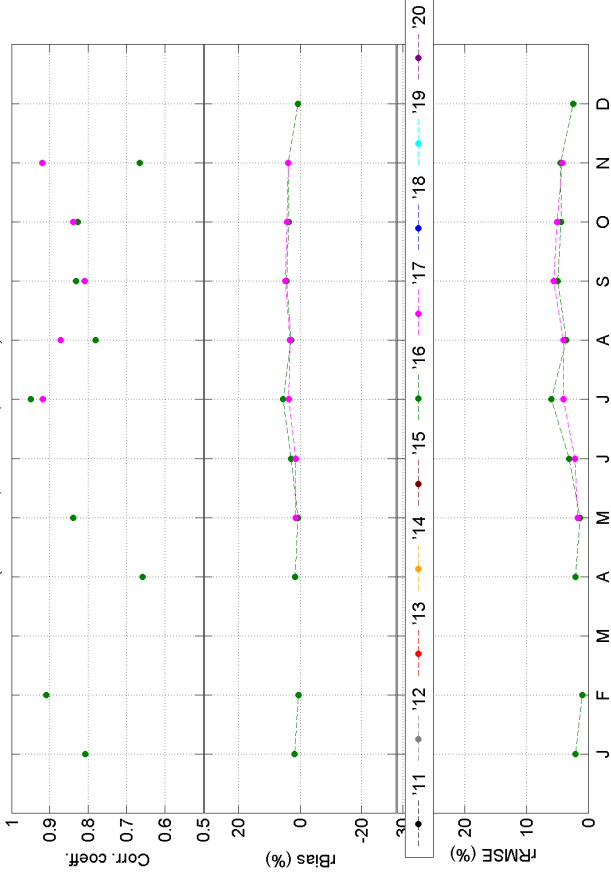


Figure S99: Comparison on clearness index at Choma

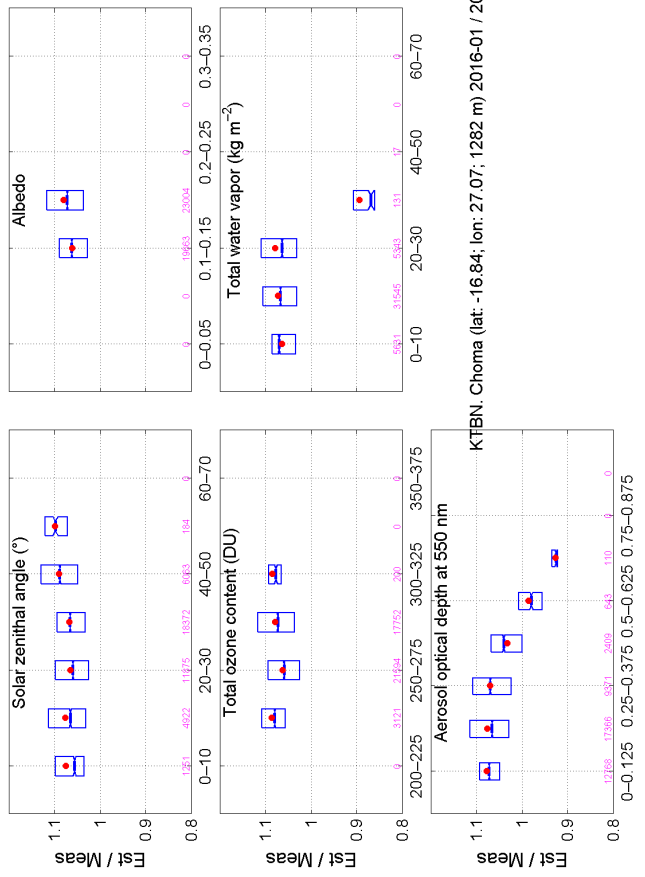
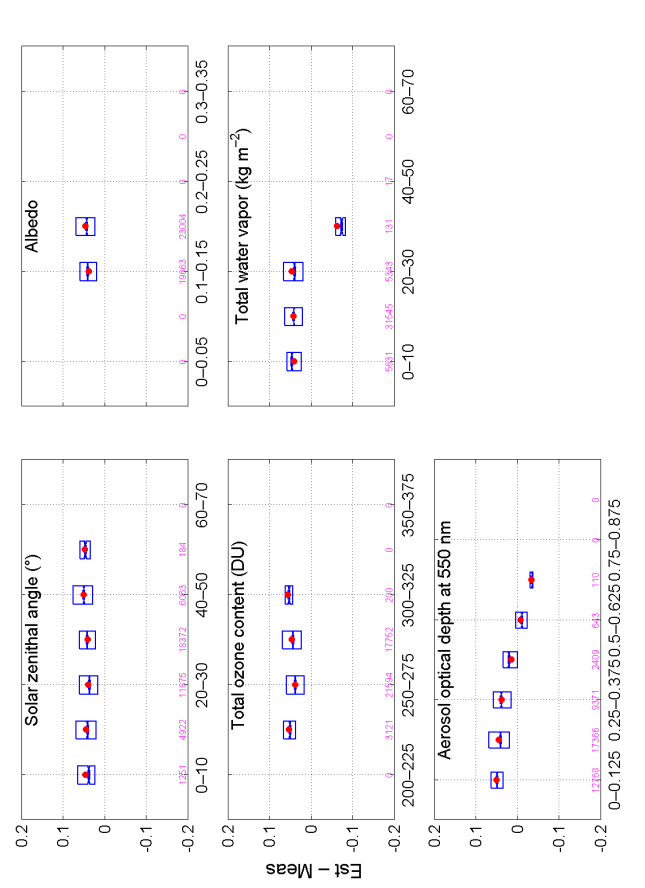
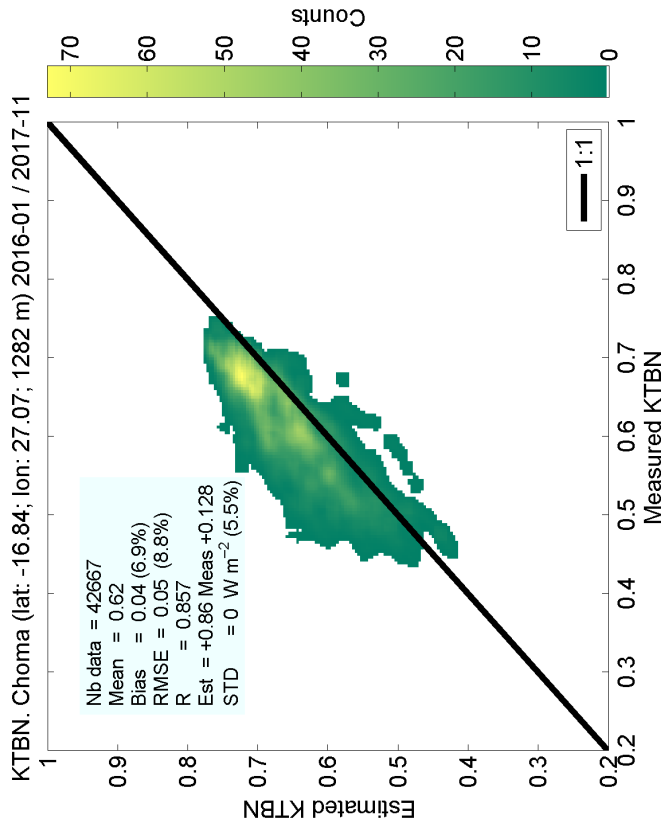
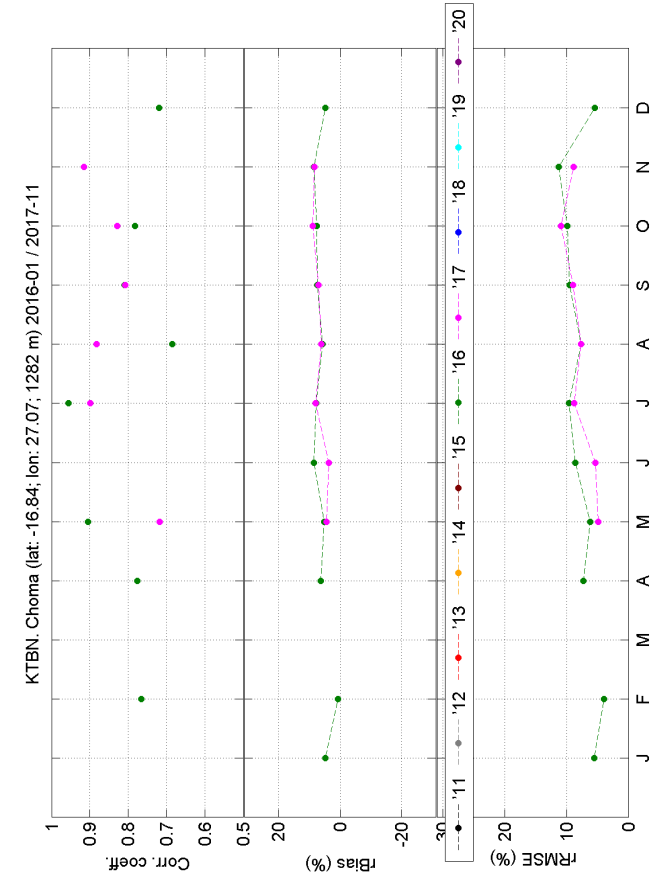


Figure S100: Comparison on direct clearness index at Choma

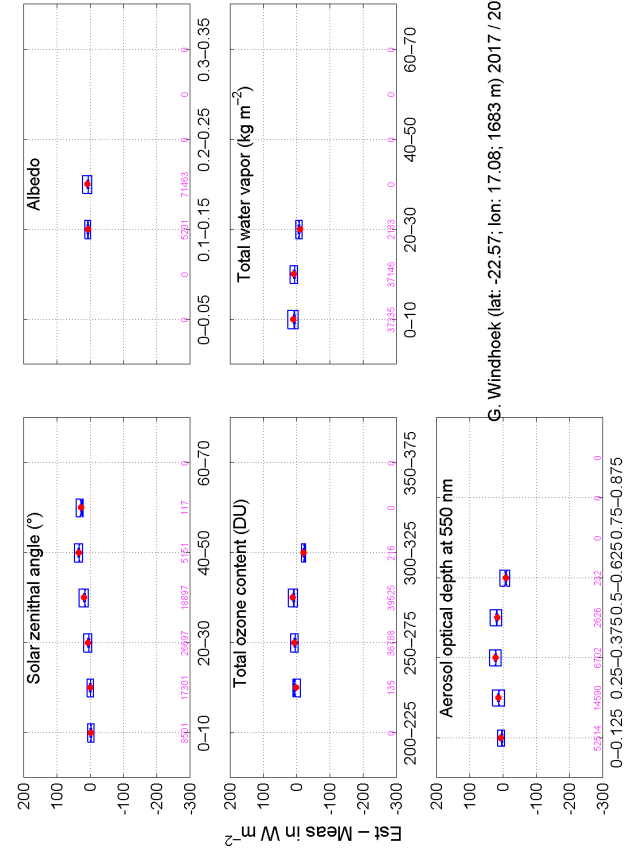
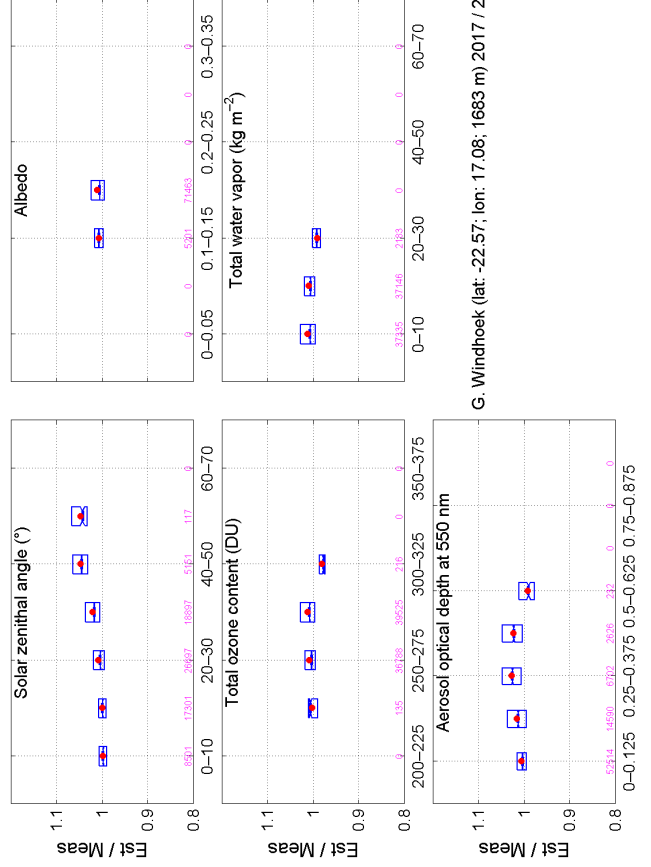
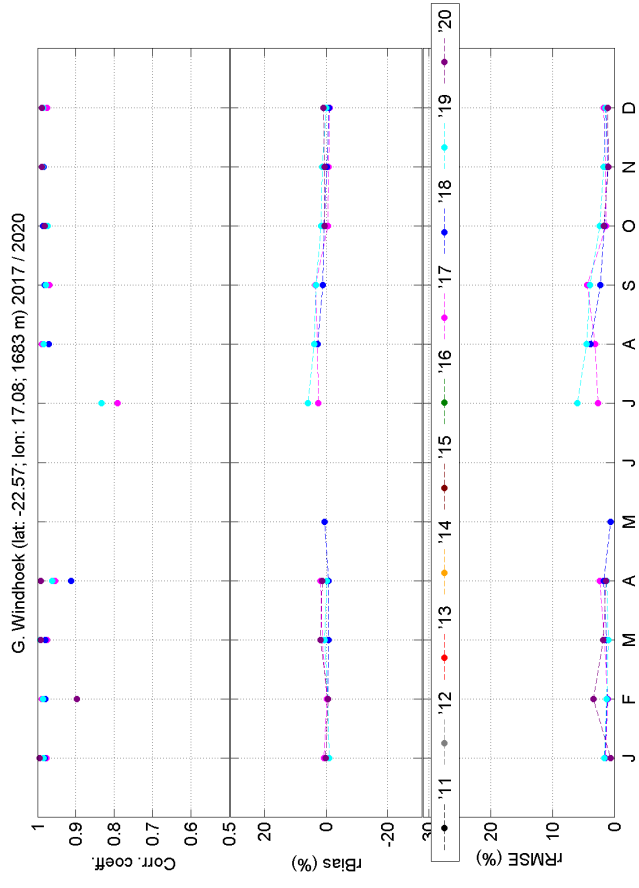
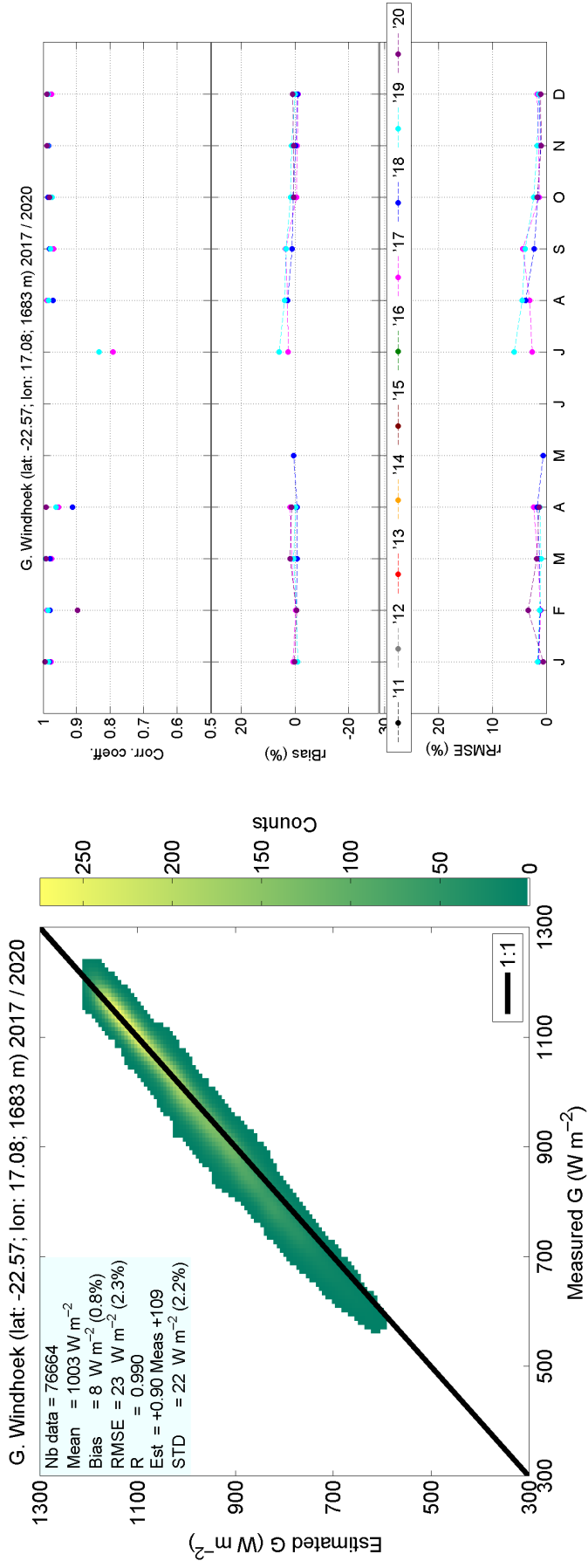


Figure S101: Comparison on global irradiance at Windhoek

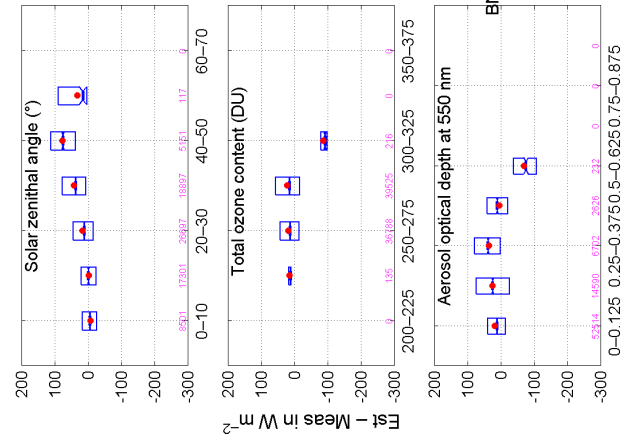
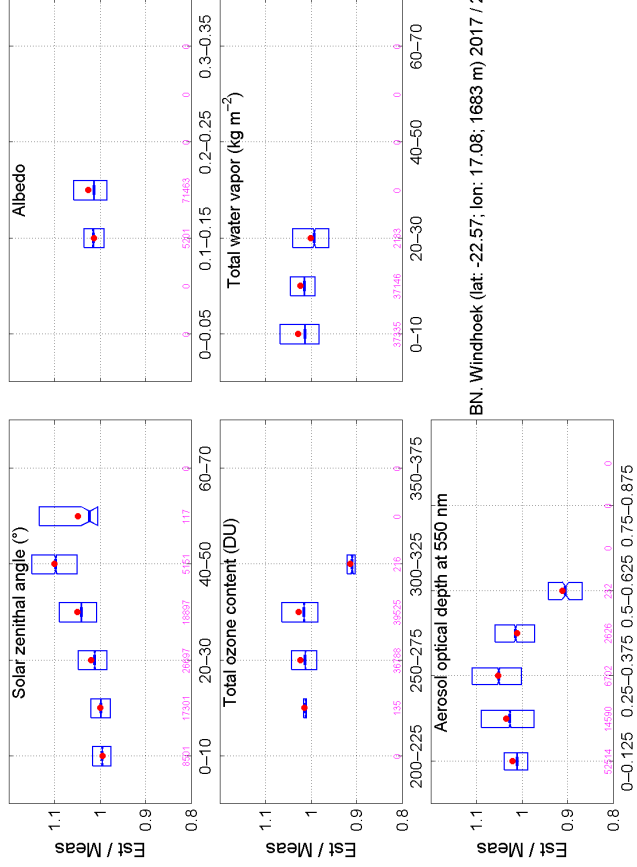
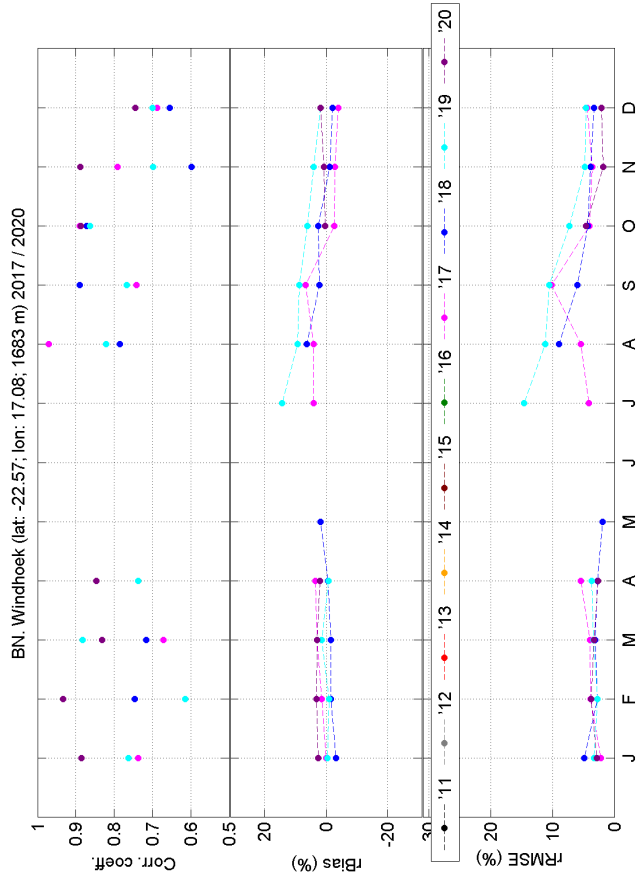
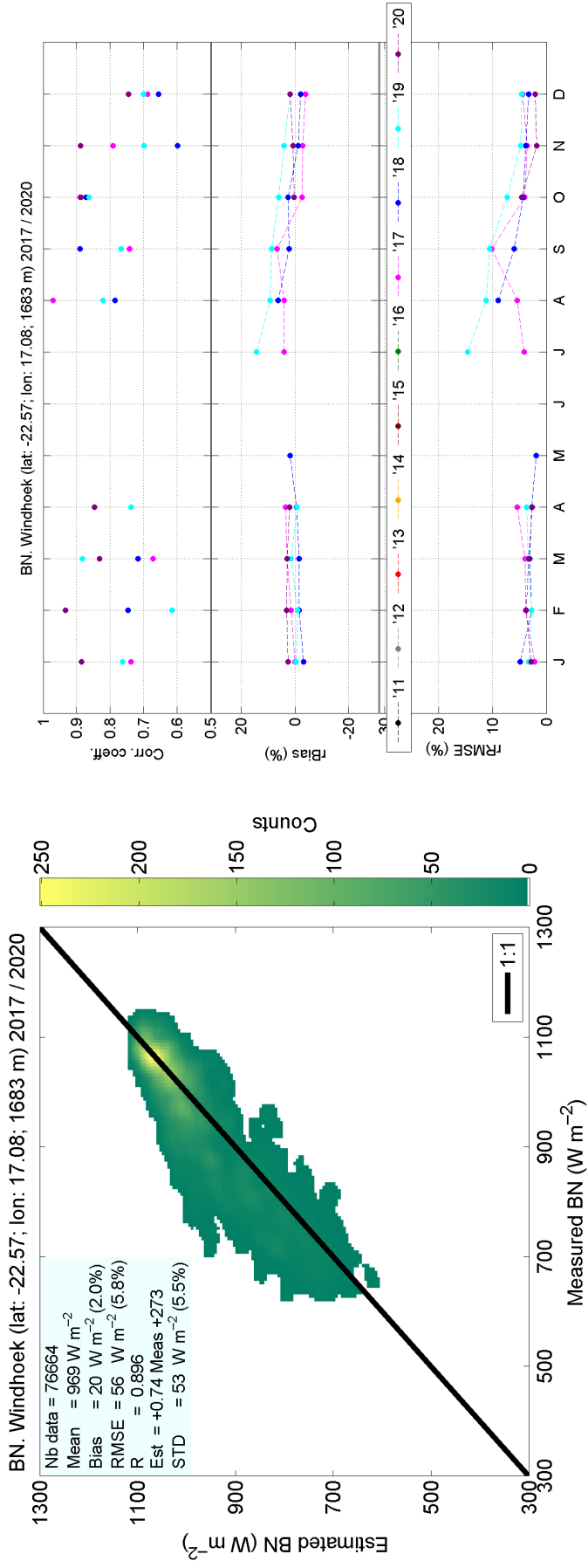


Figure S102: Comparison on direct component at normal irradiance at Windhoek

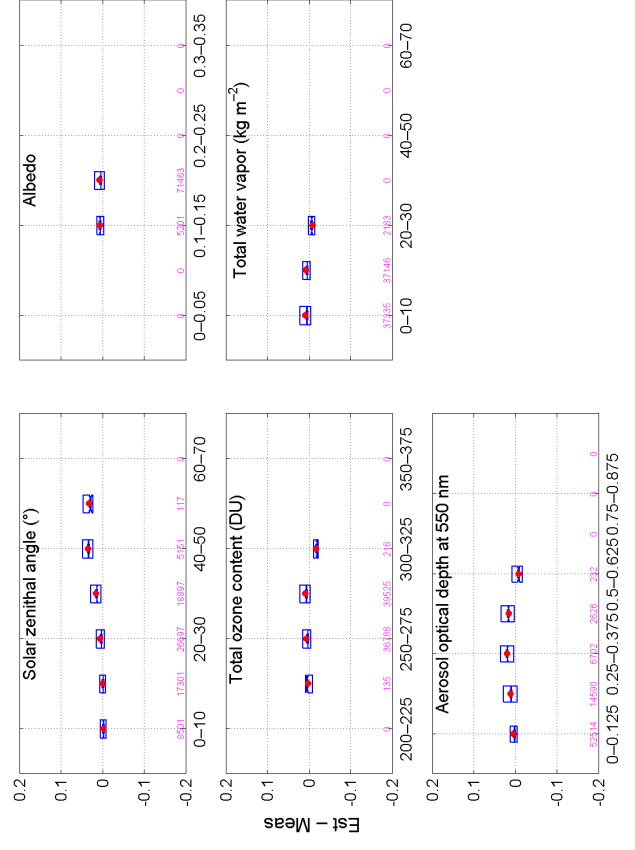
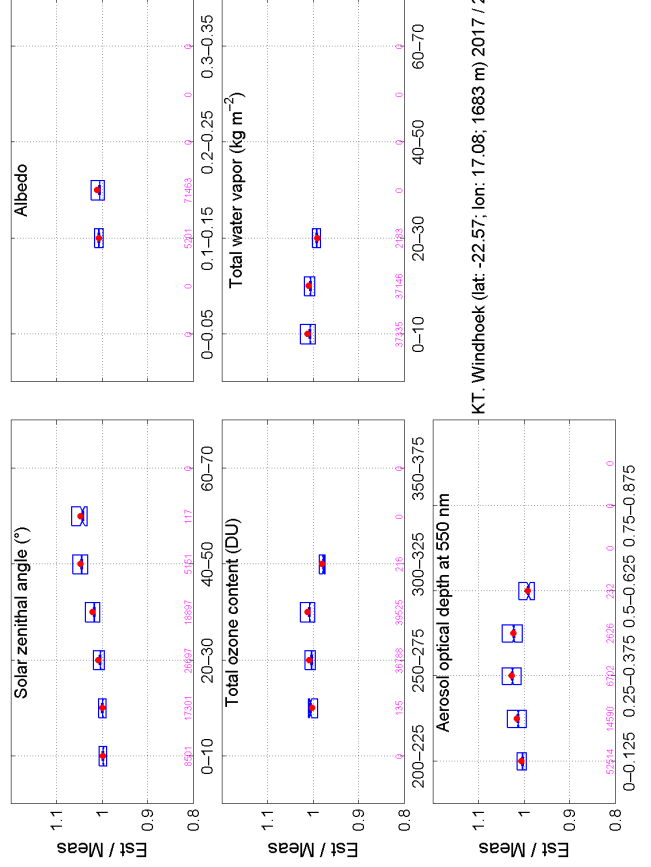
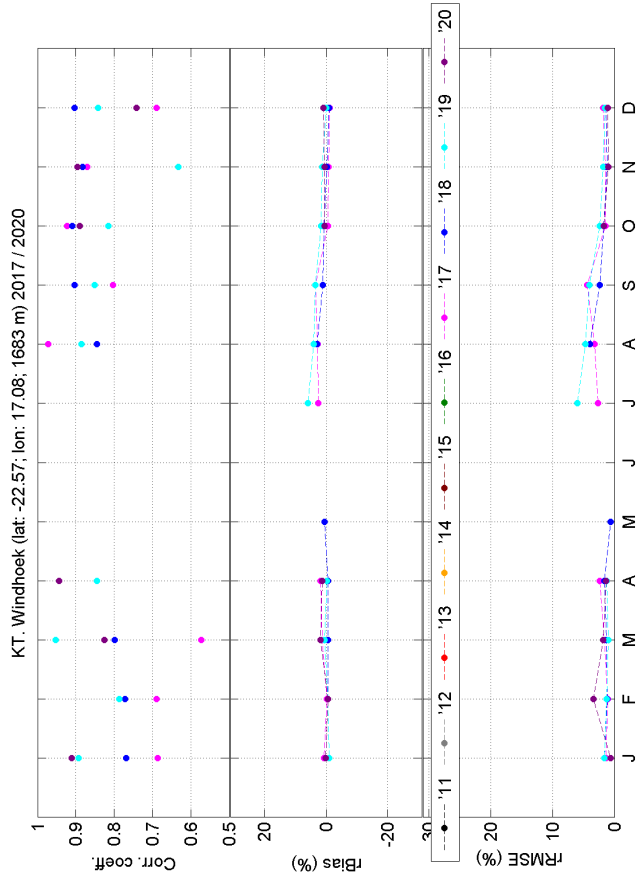
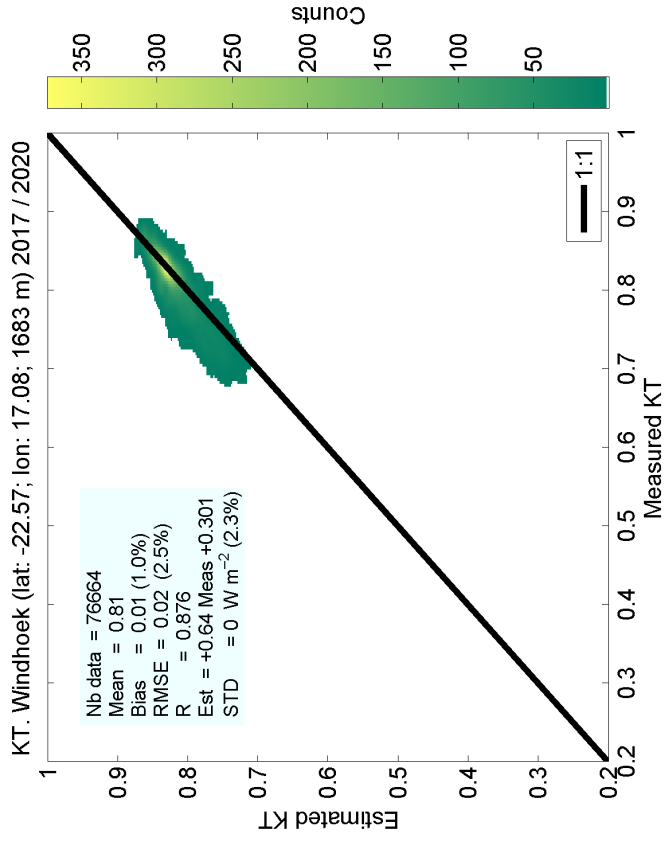
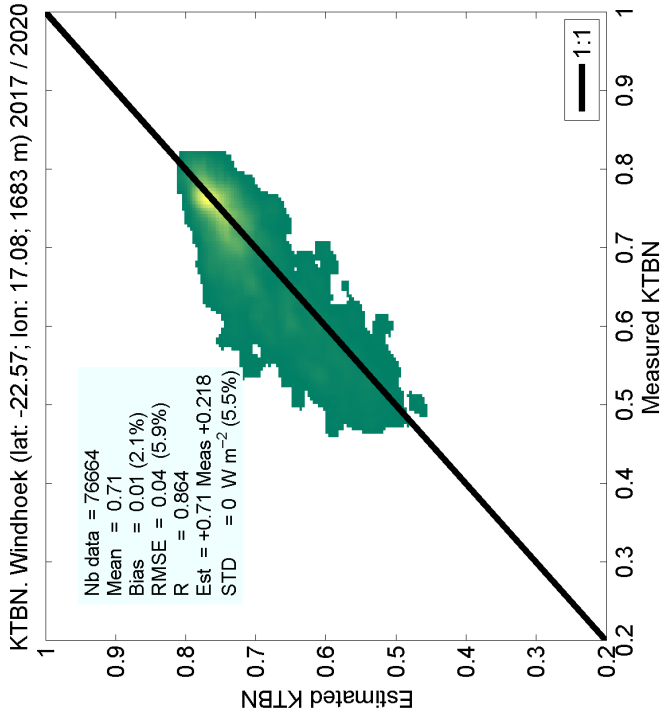


Figure S103: Comparison on clearness index at Windhoek



KTBN, Windhoek (lat: -22.57; lon: 17.08; 1683 m) 2017 / 2020

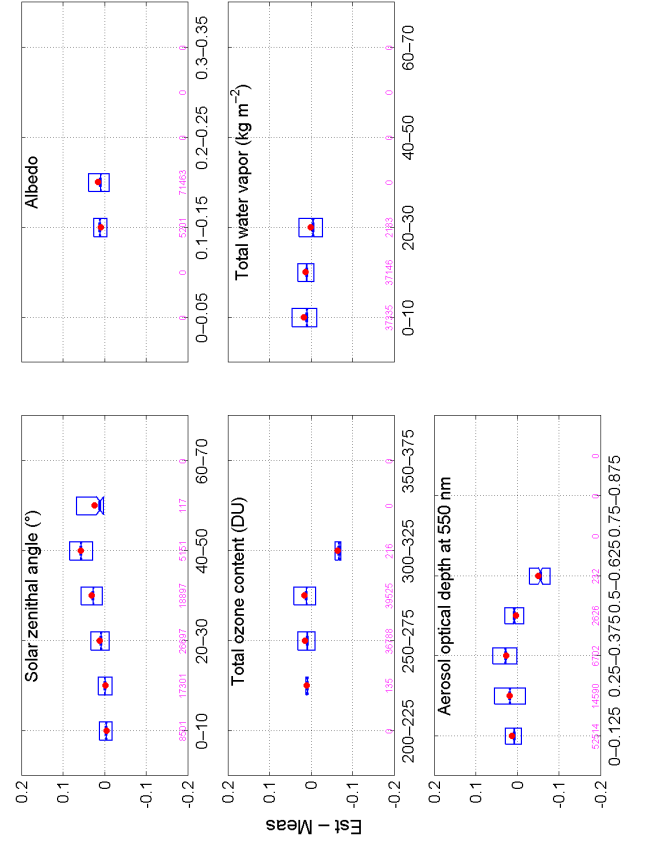
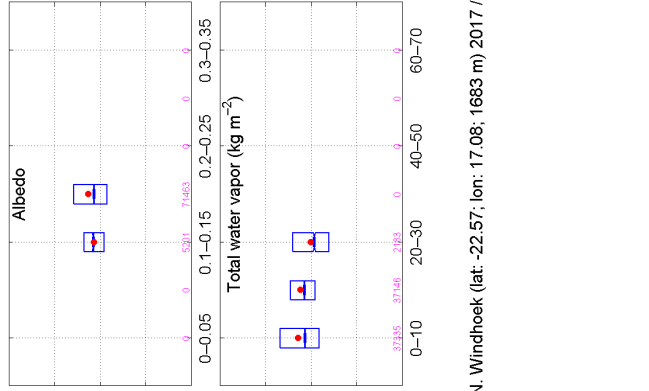
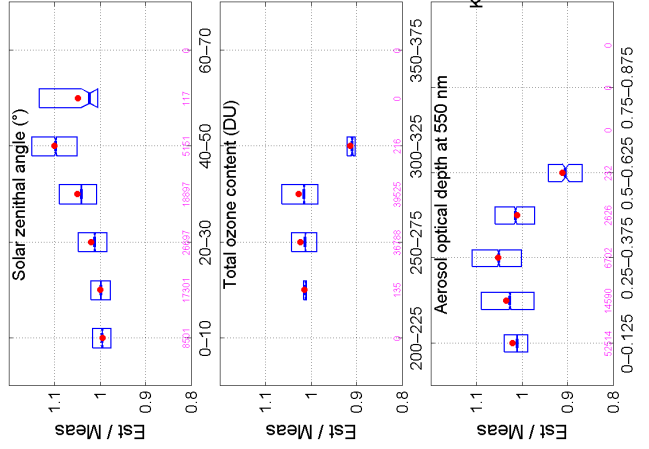
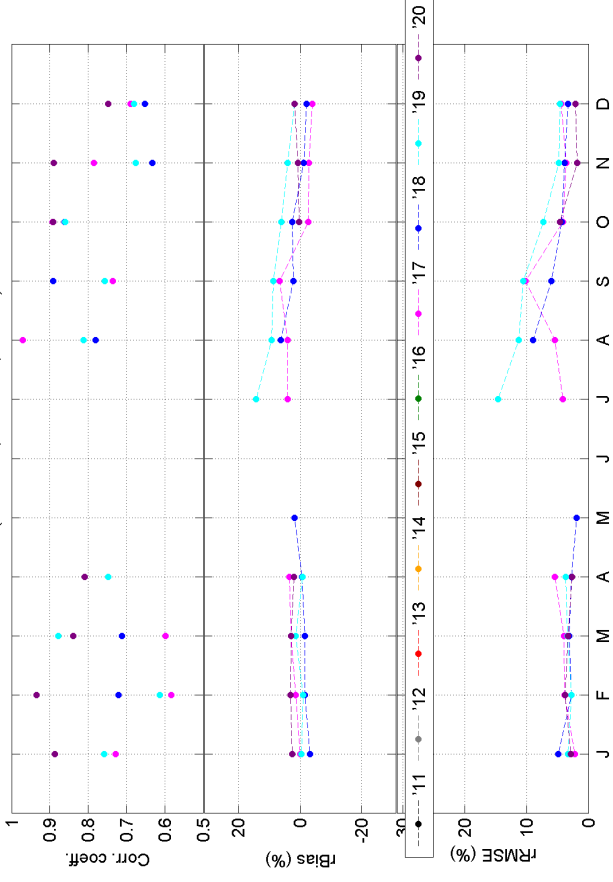


Figure S104: Comparison on direct clearness index at Windhoek

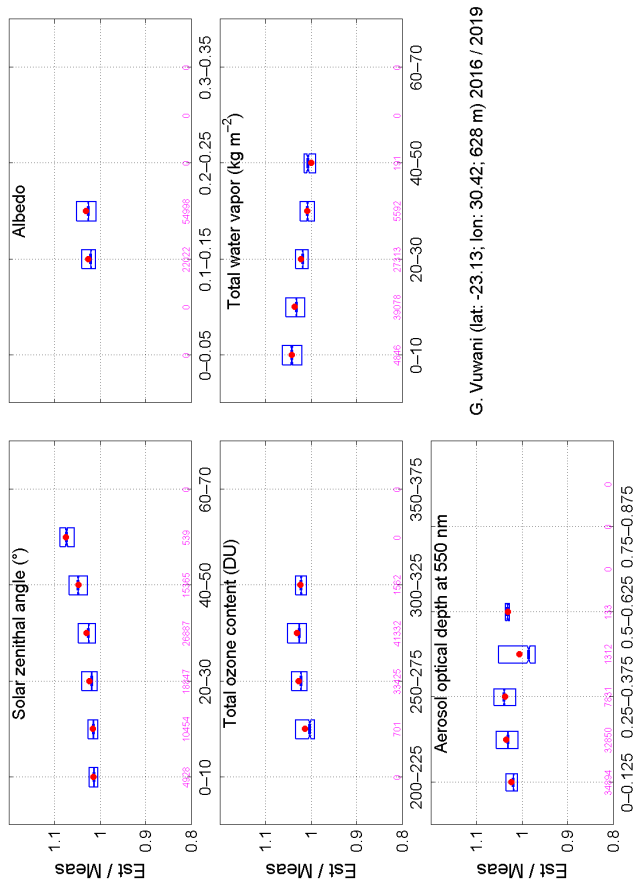
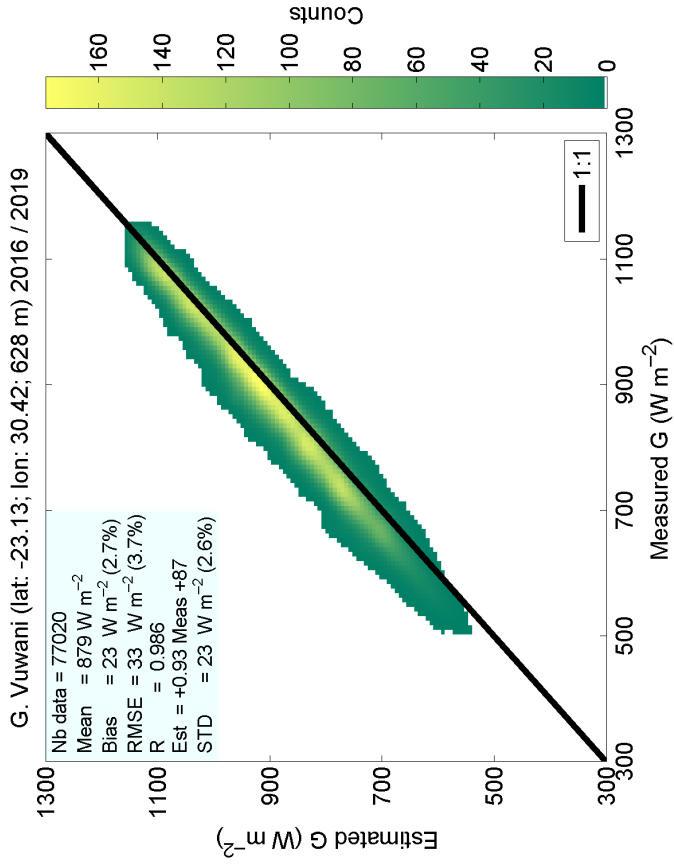
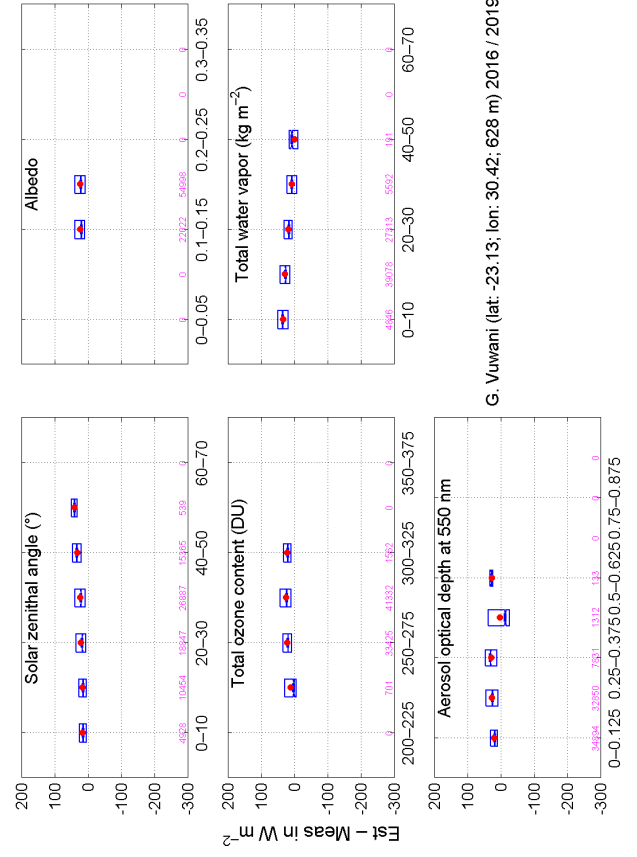
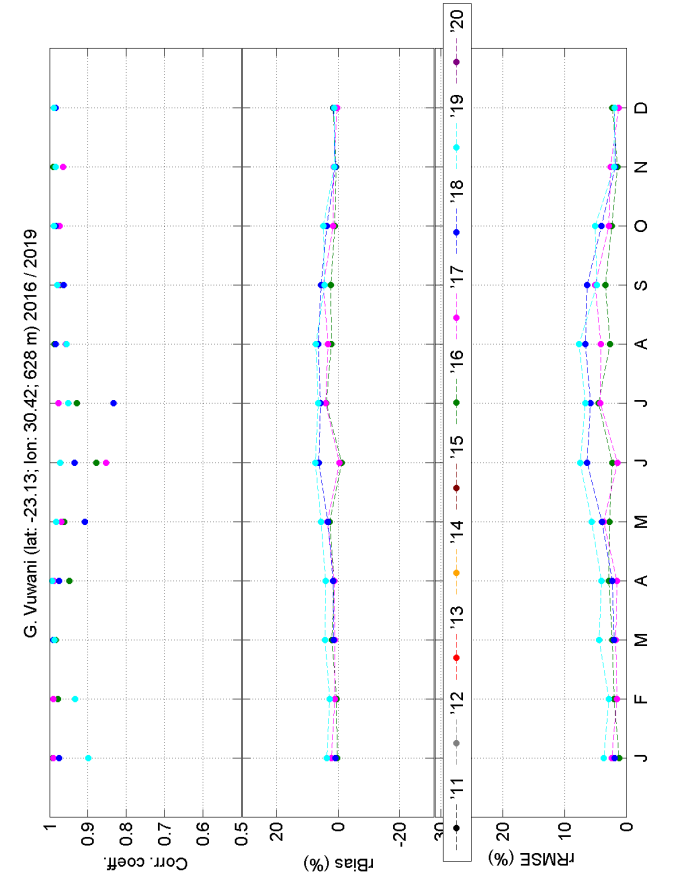


Figure S105: Comparison on global irradiance at Vuwani

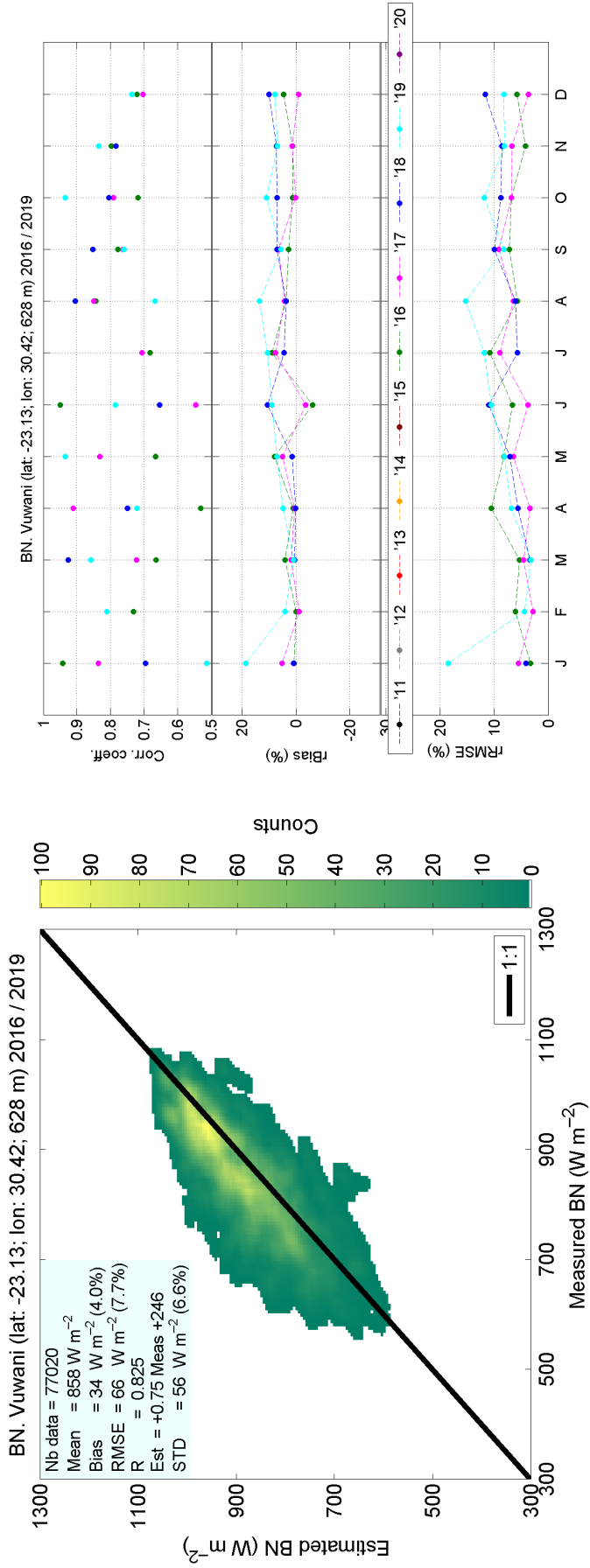
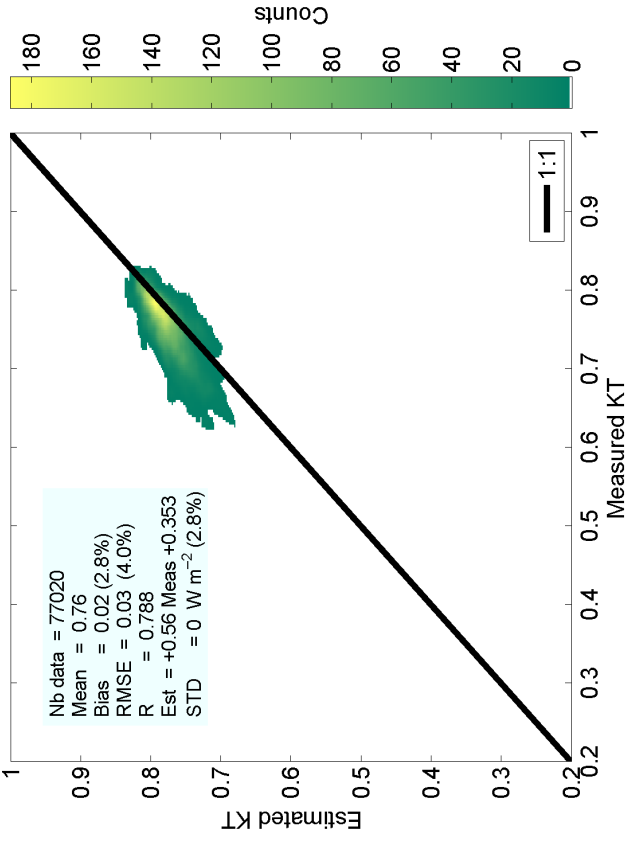
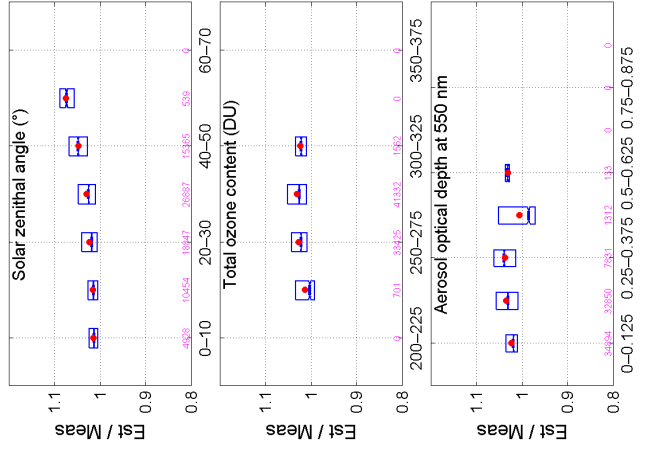
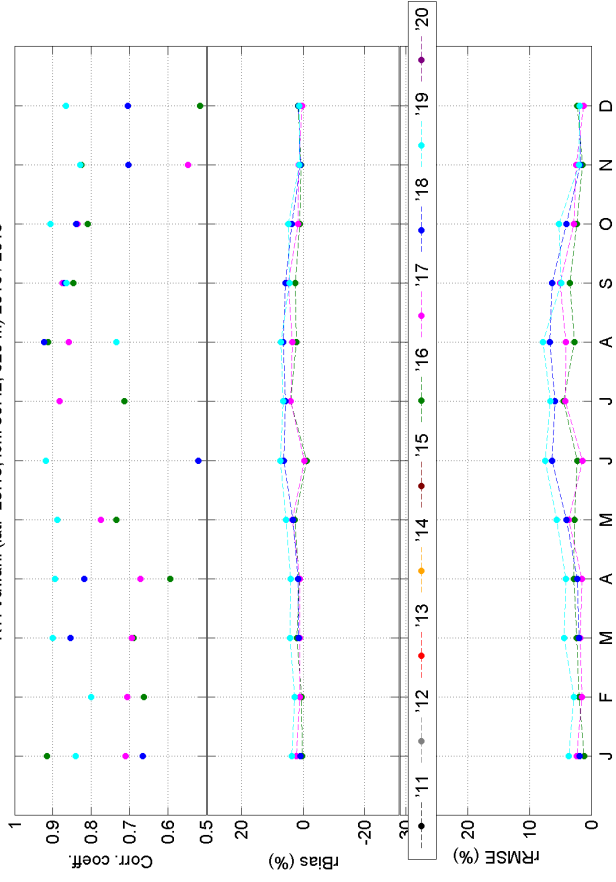


Figure S106: Comparison on direct component at normal irradiance at Vuwani

KT. Vuwani (lat: -23.13; lon: 30.42; 628 m) 2016 / 2019



KT. Vuwani (lat: -23.13; lon: 30.42; 628 m) 2016 / 2019



KT. Vuwani (lat: -23.13; lon: 30.42; 628 m) 2016 / 2019

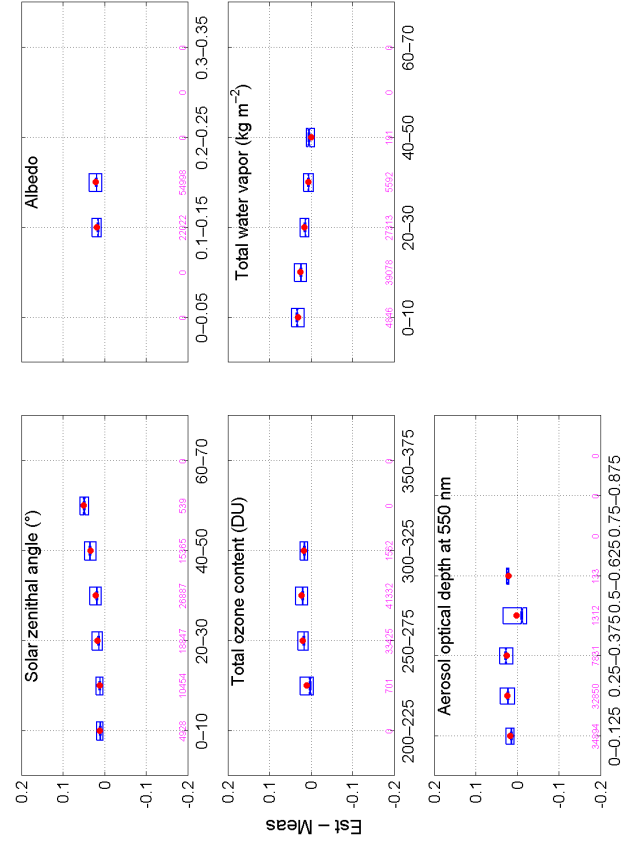
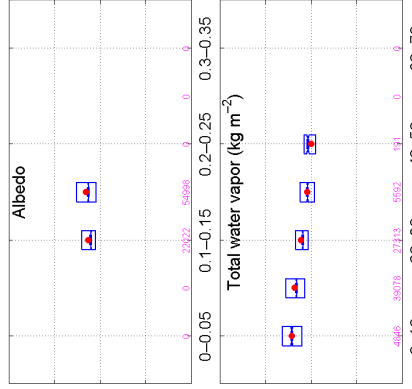


Figure S107: Comparison on clearness index at Vuwani

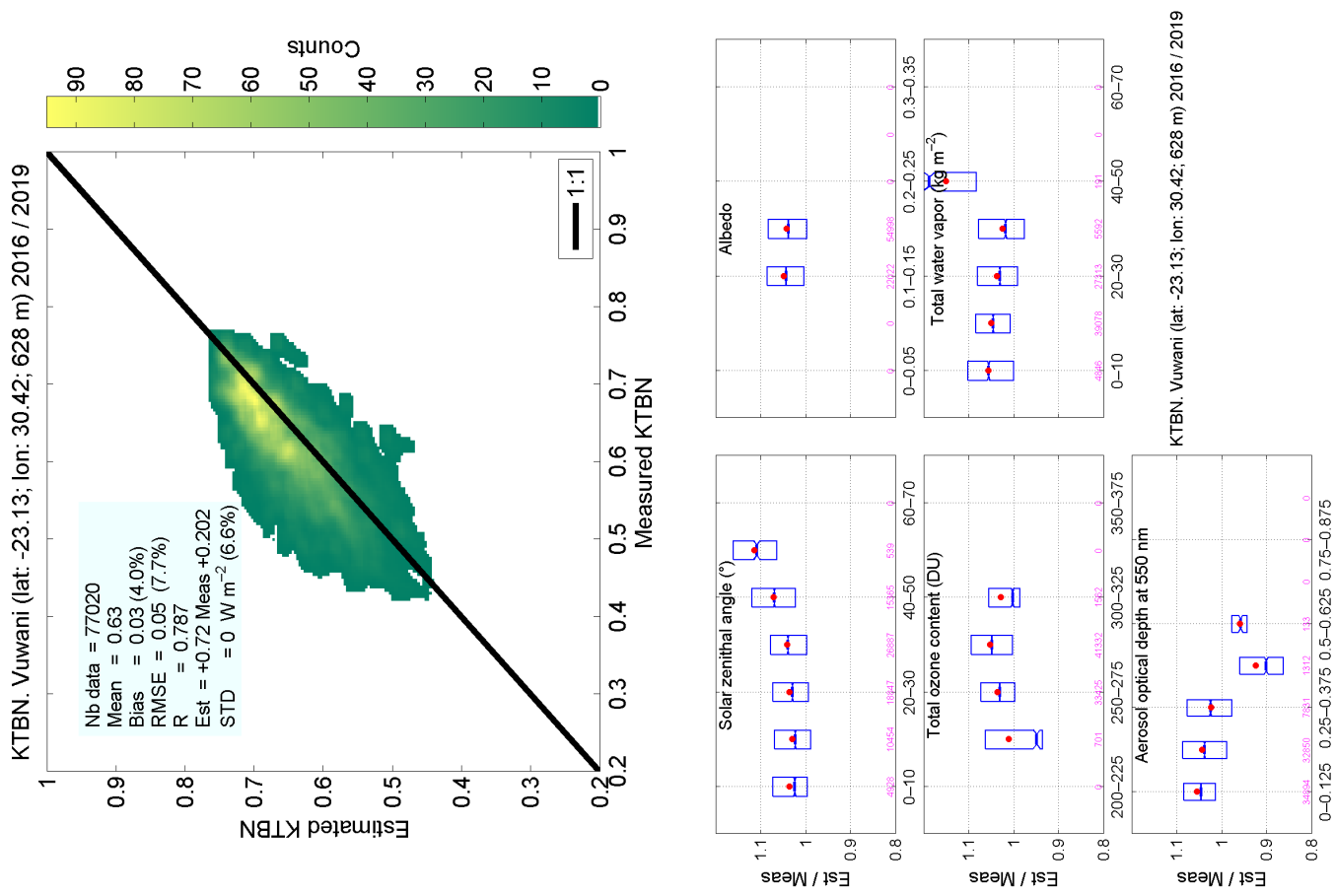
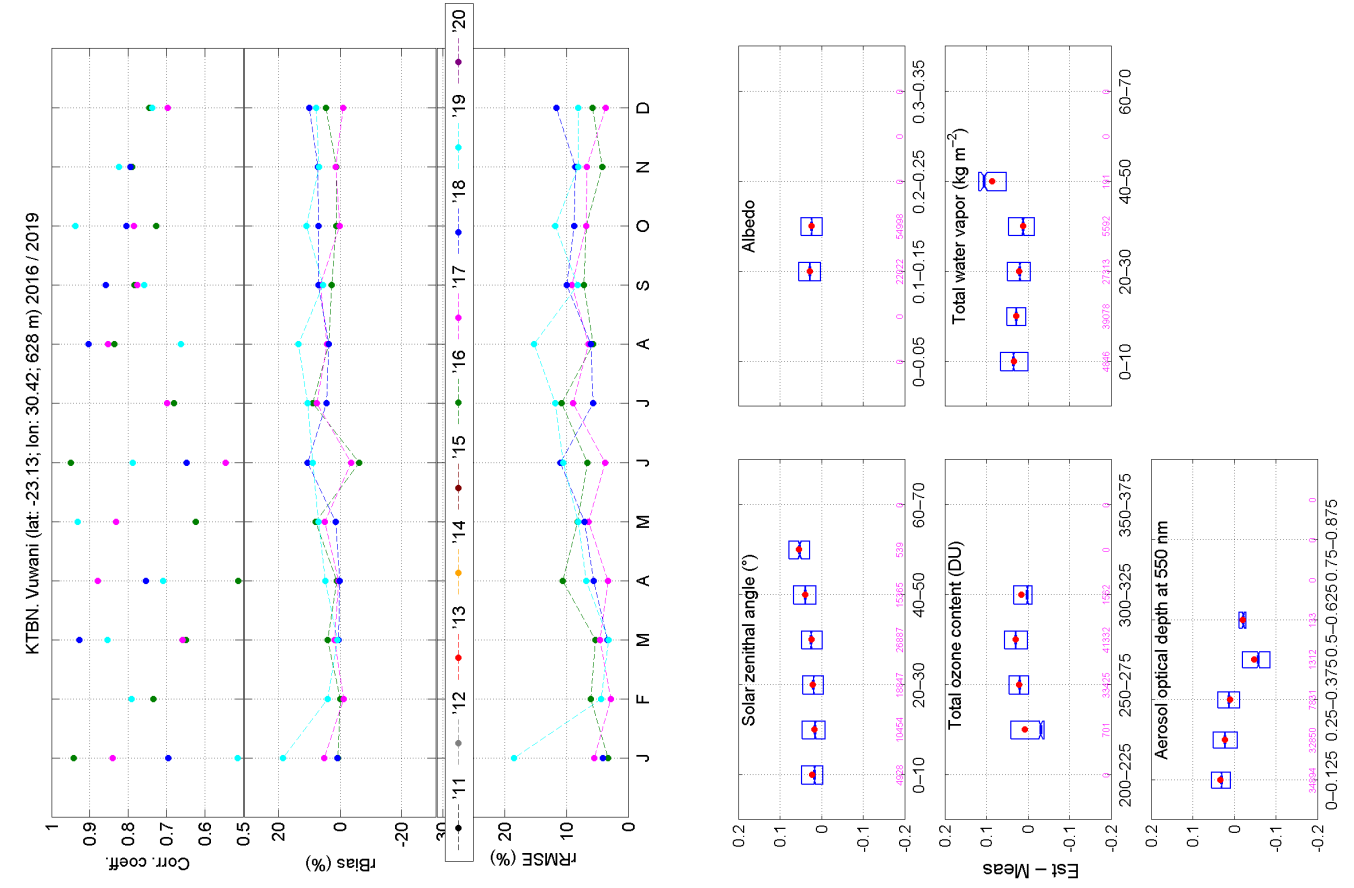


Figure S108: Comparison on direct clearness index at Vuwani

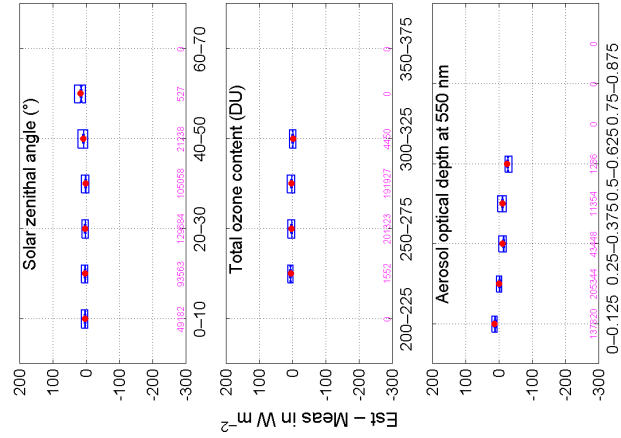
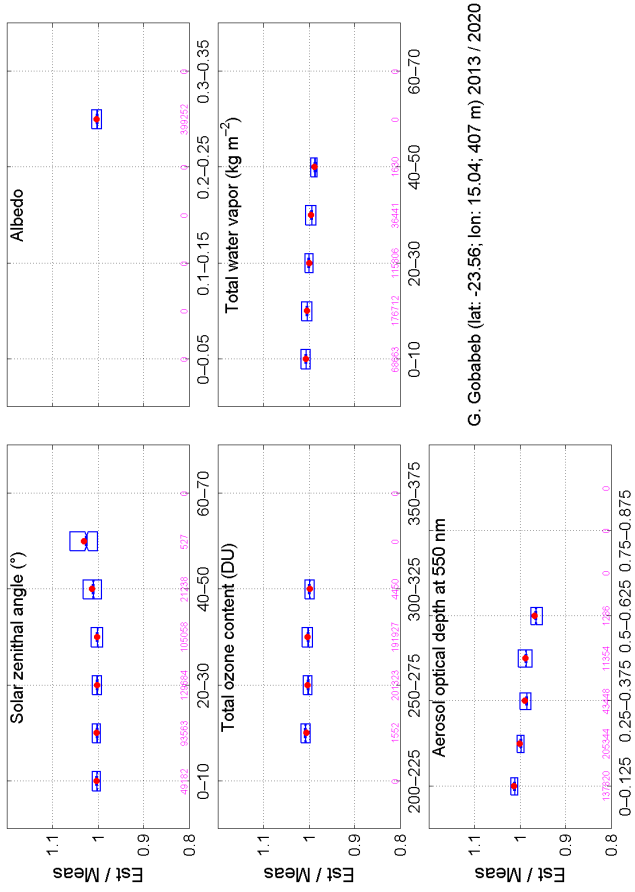
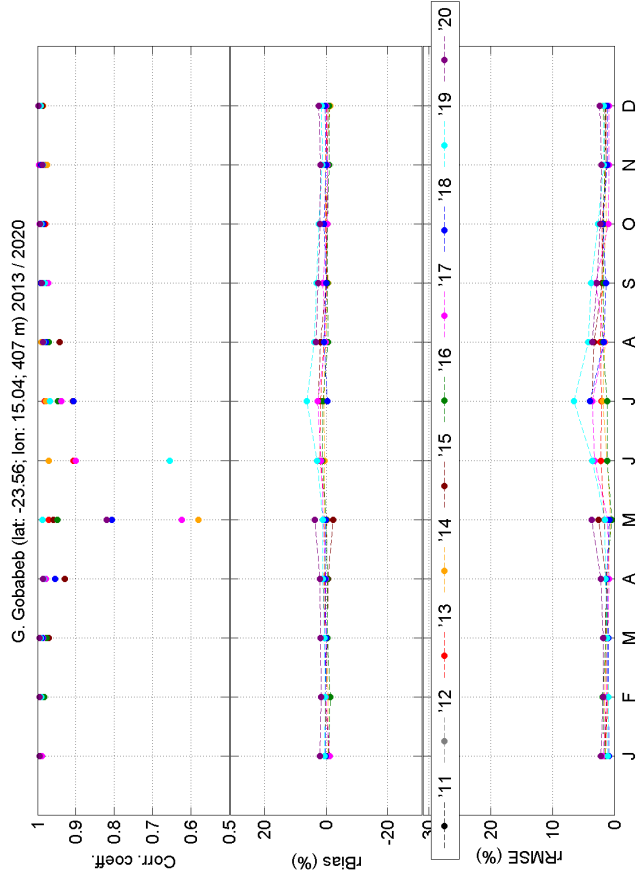
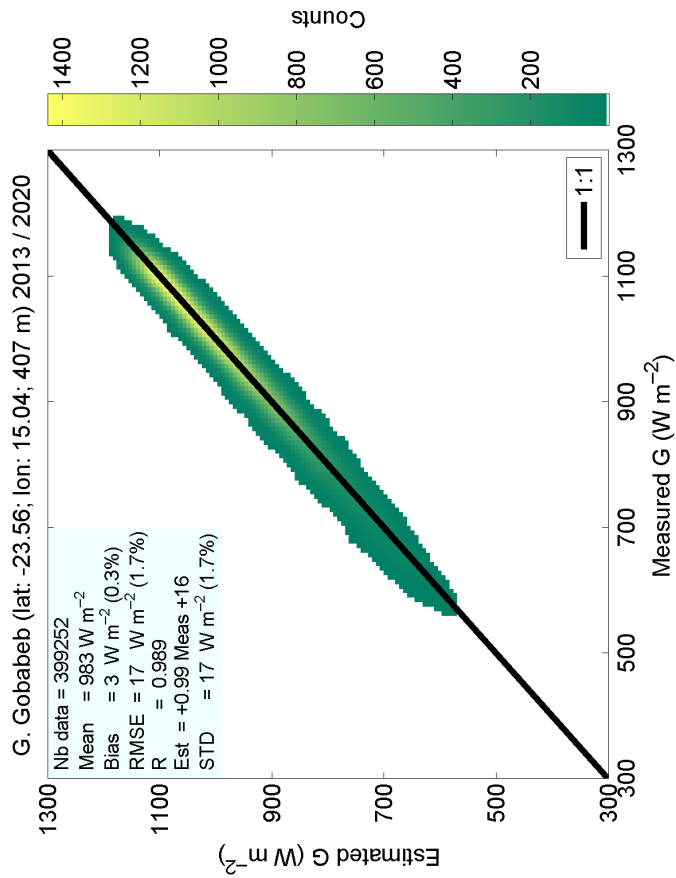
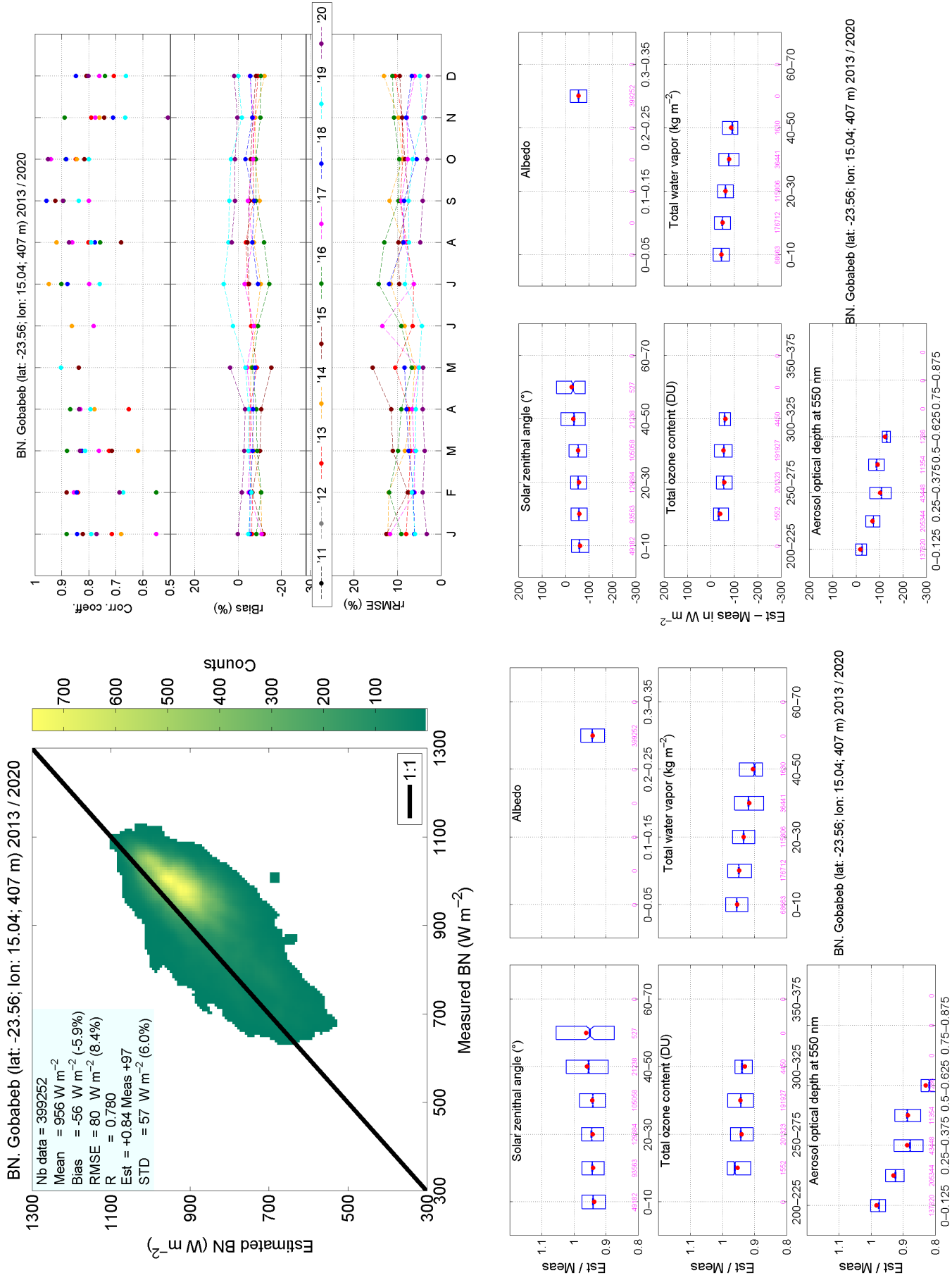


Figure S109: Comparison on global irradiance at Gobabeb



BN, Gobabeb (lat: -23.56; lon: 15.04; 407 m) 2013 / 2020

BN, Gobabeb (lat: -23.56; lon: 15.04; 407 m) 2013 / 2020

Figure S110: Comparison on direct component at normal irradiance at Gobabeb

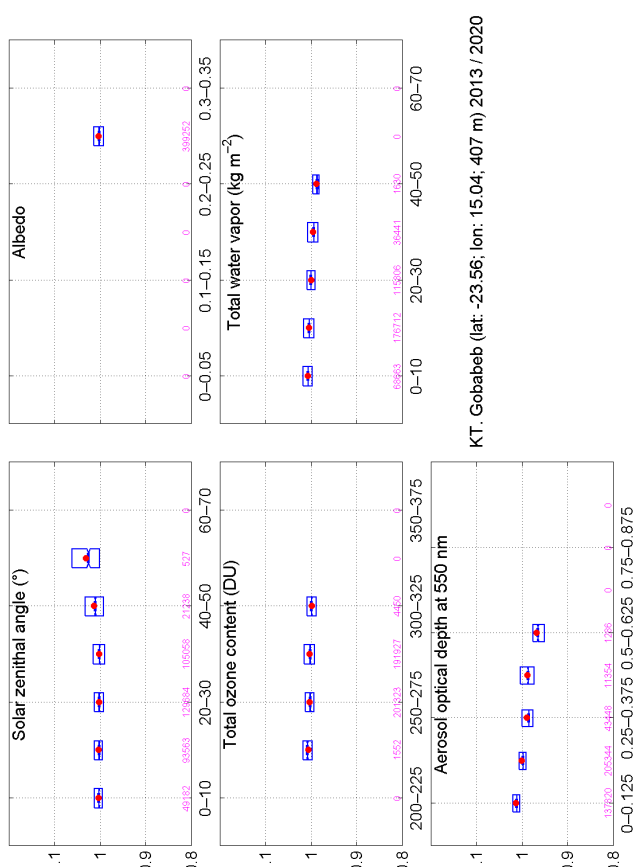
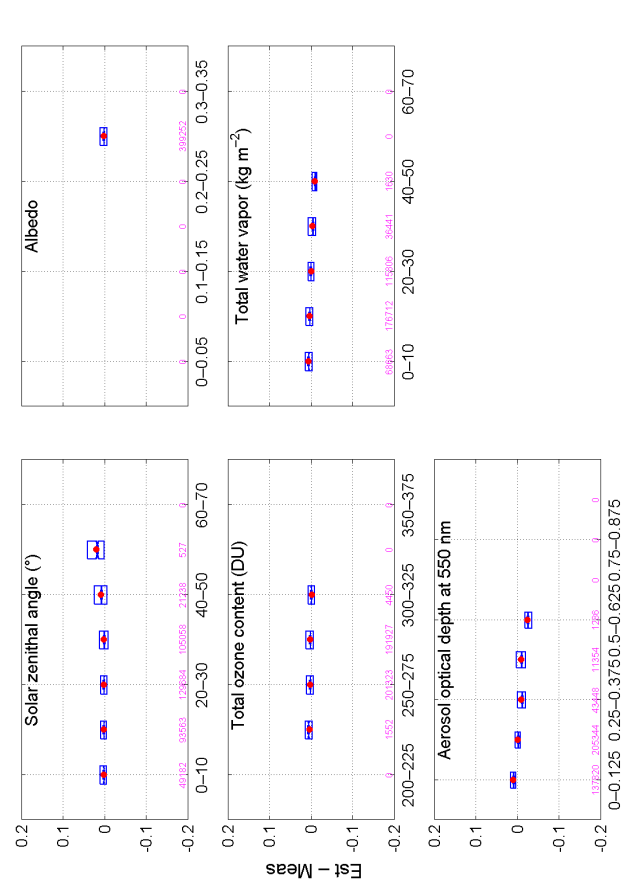
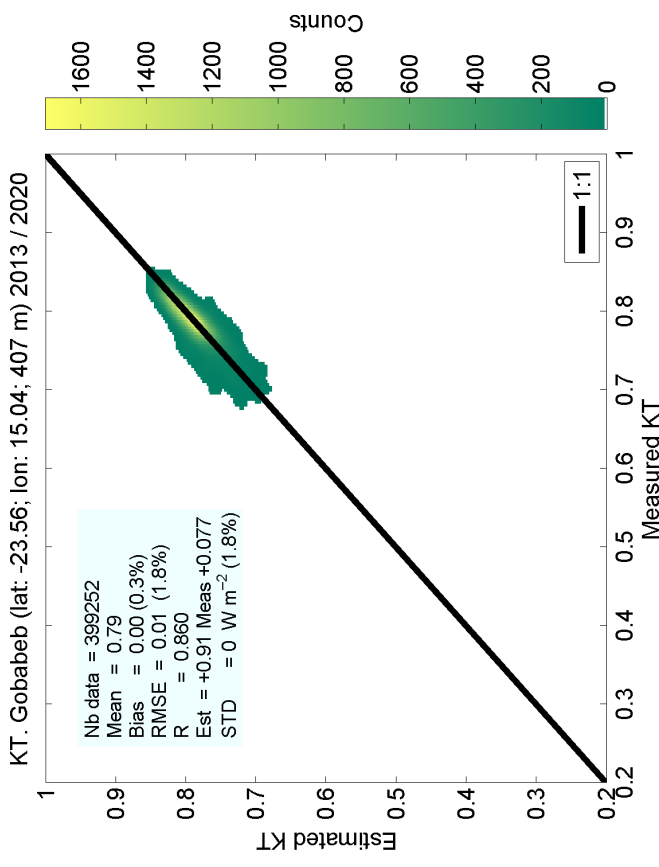
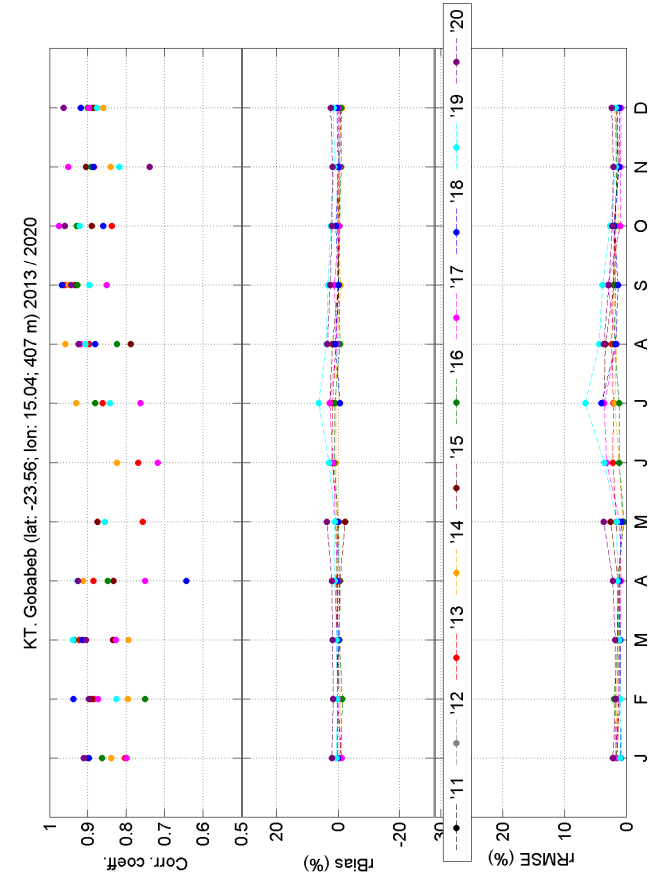


Figure S111: Comparison on clearness index at Gobabeb

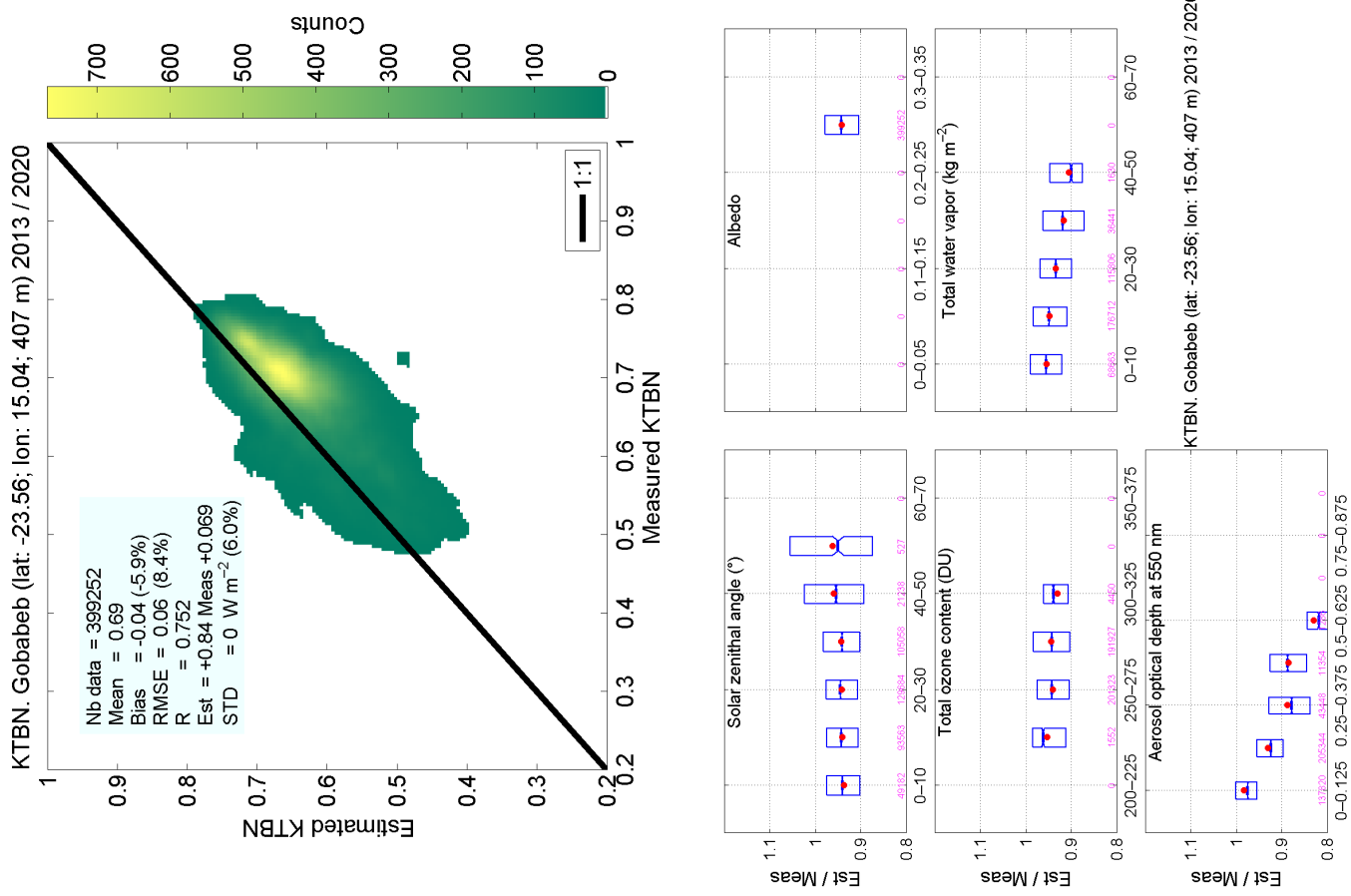
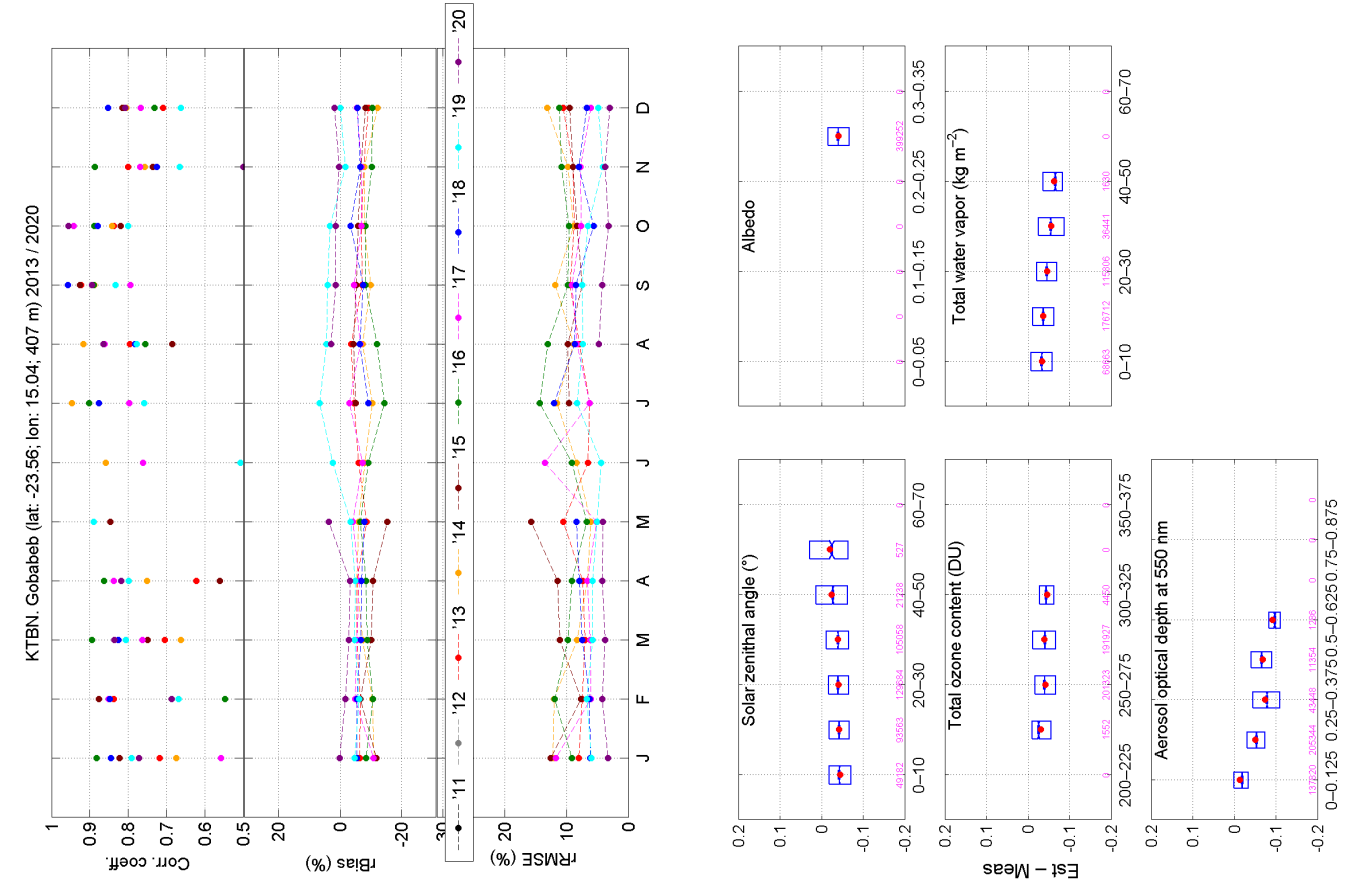


Figure S112: Comparison on direct clearness index at Gobabeb

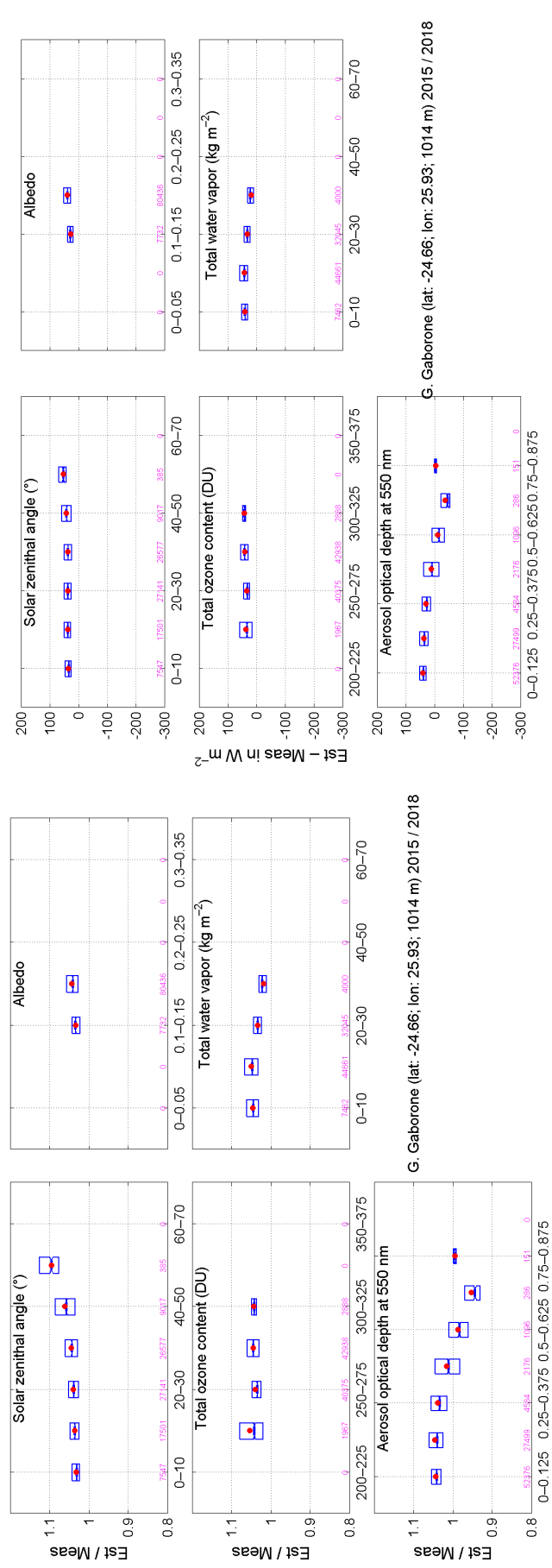
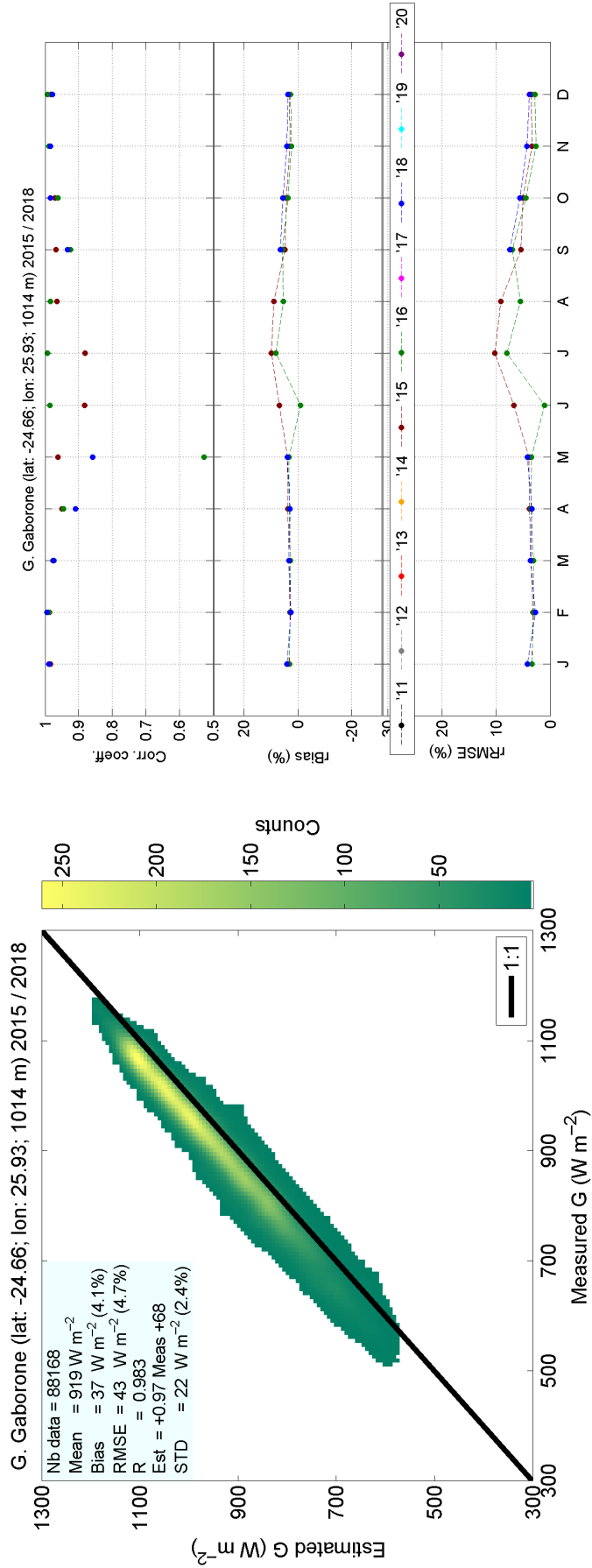


Figure S113: Comparison on global irradiance at Gaborone

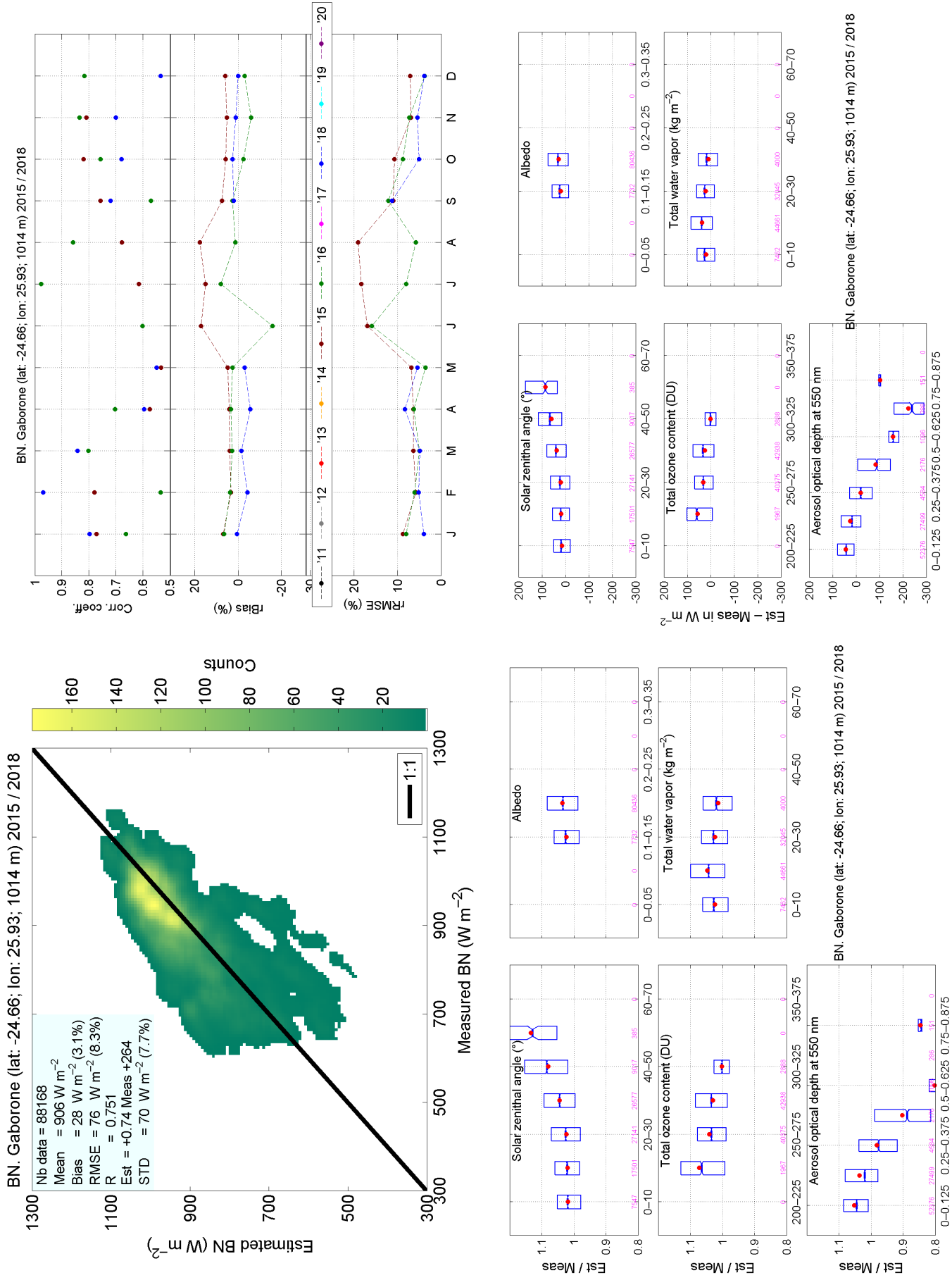


Figure S114: Comparison on direct component at normal irradiance at Gaborone

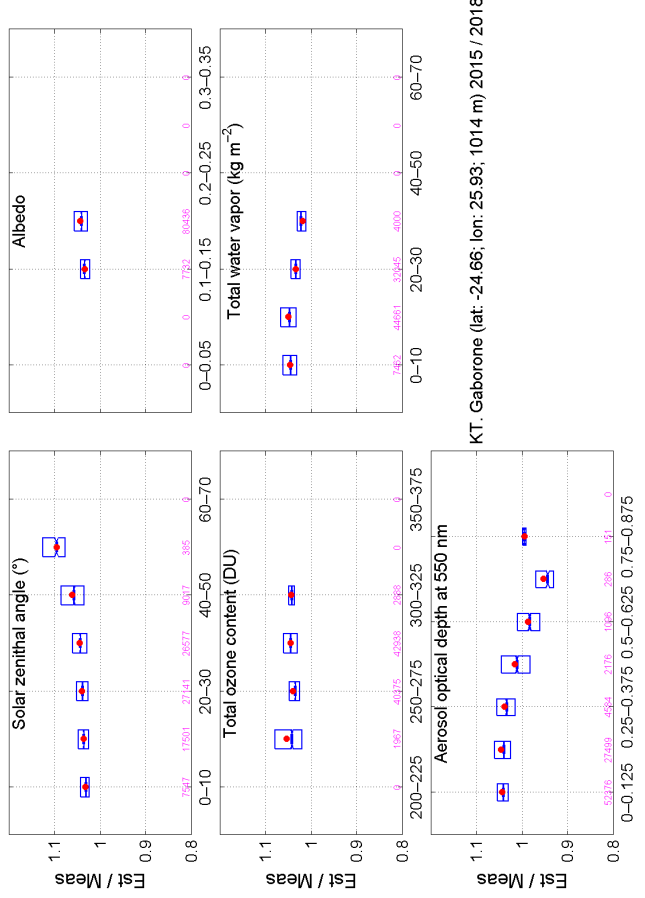
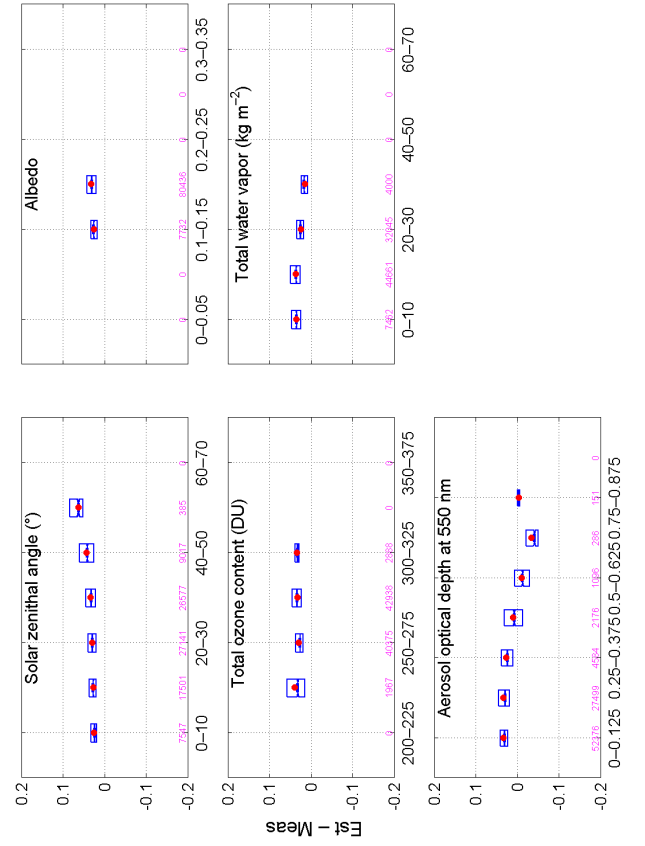
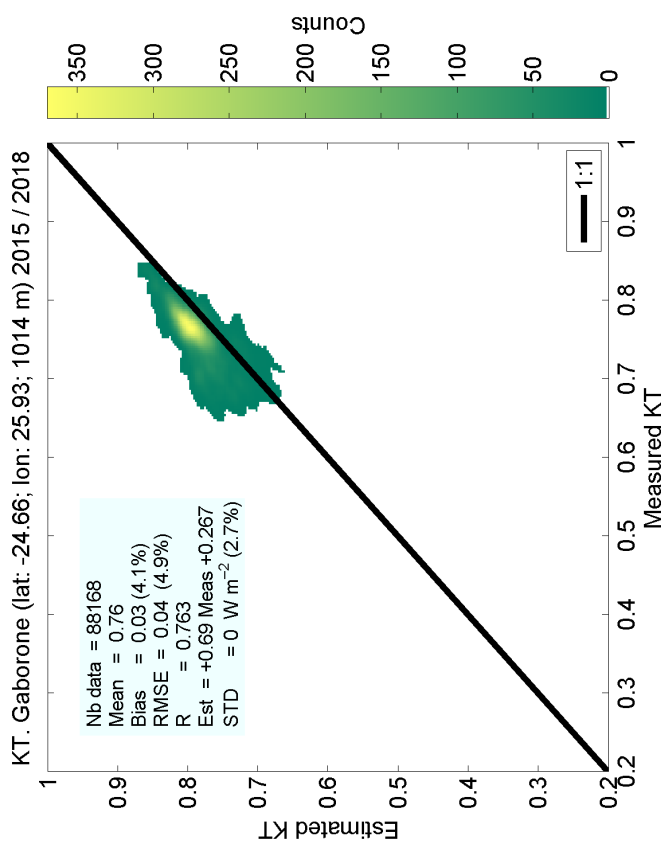
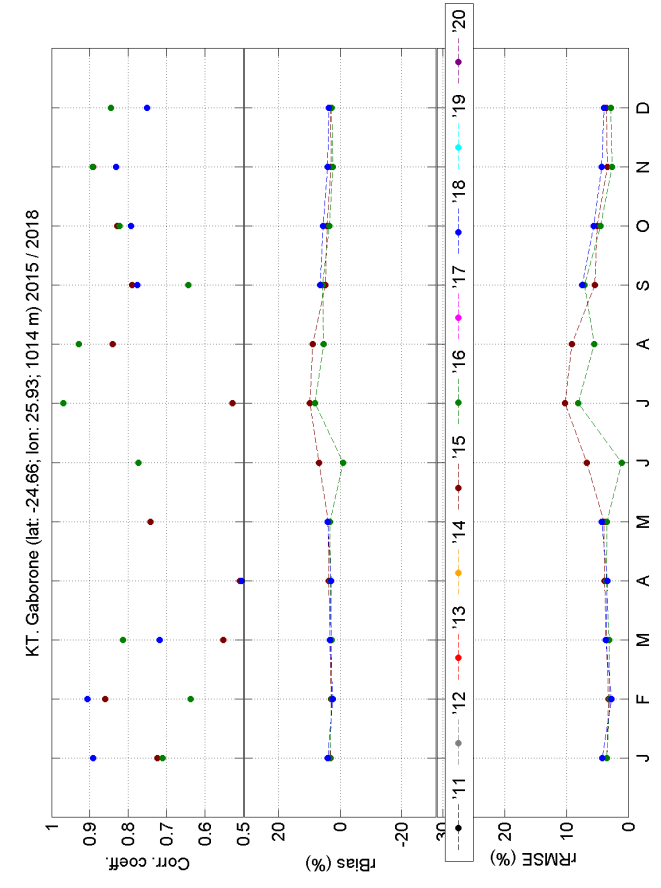


Figure S115: Comparison on clearness index at Gaborone

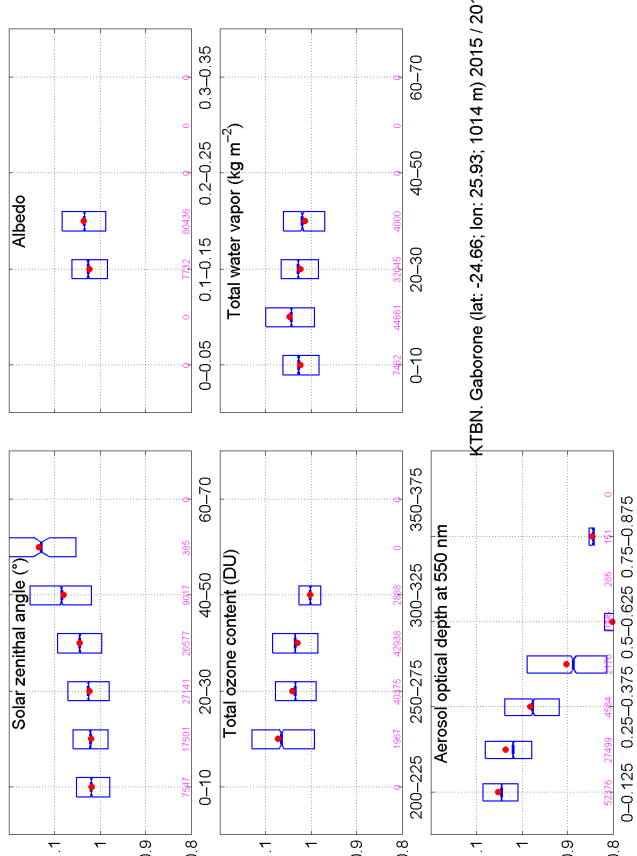
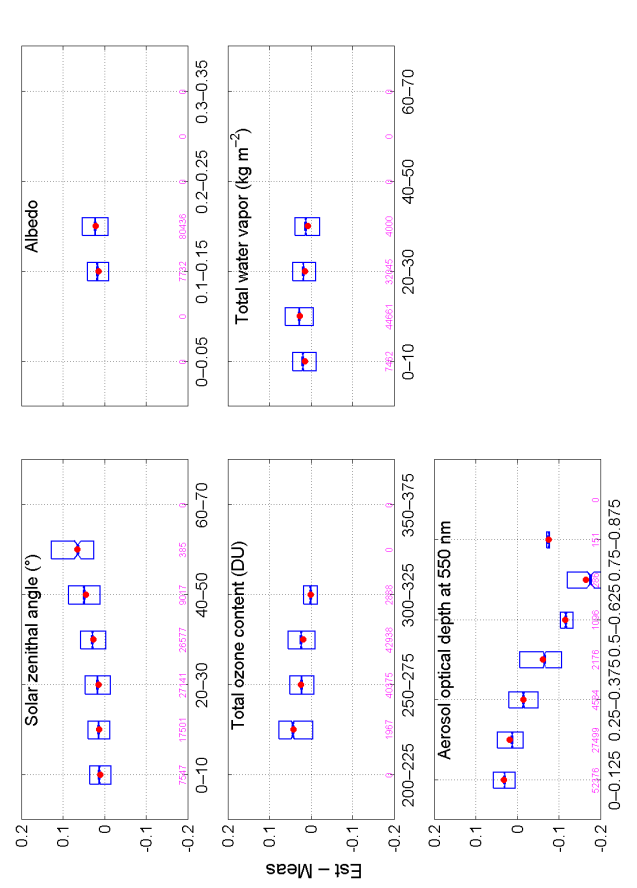
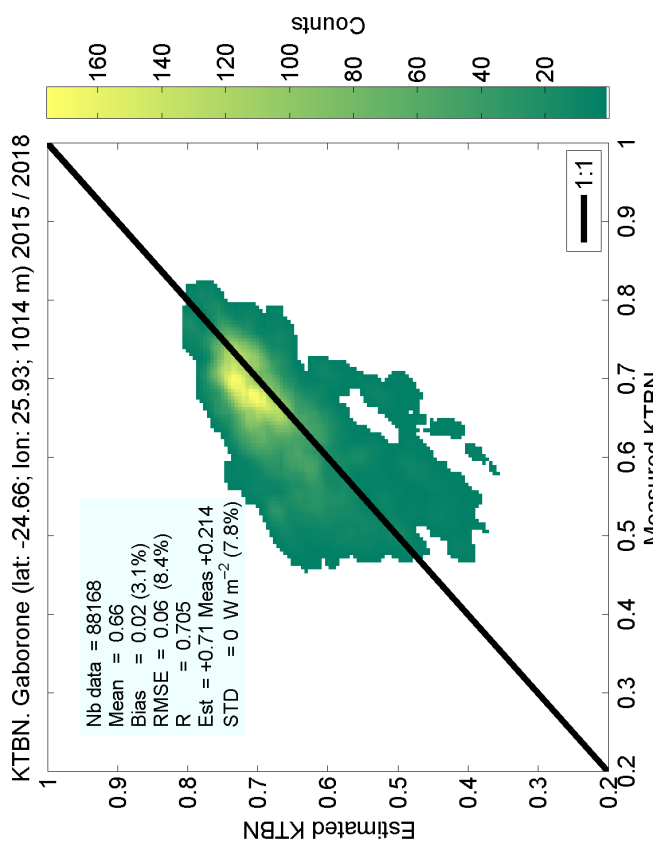
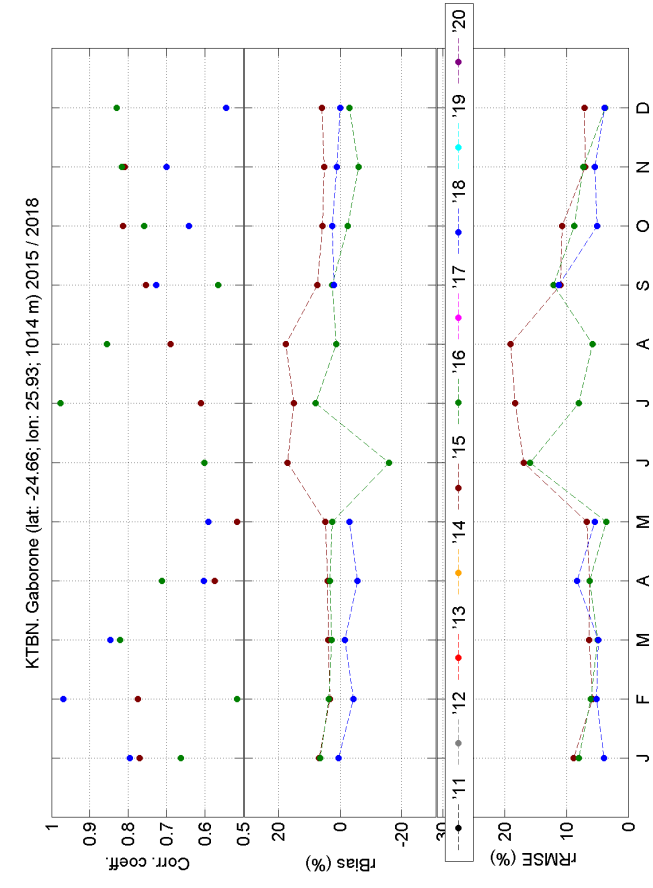
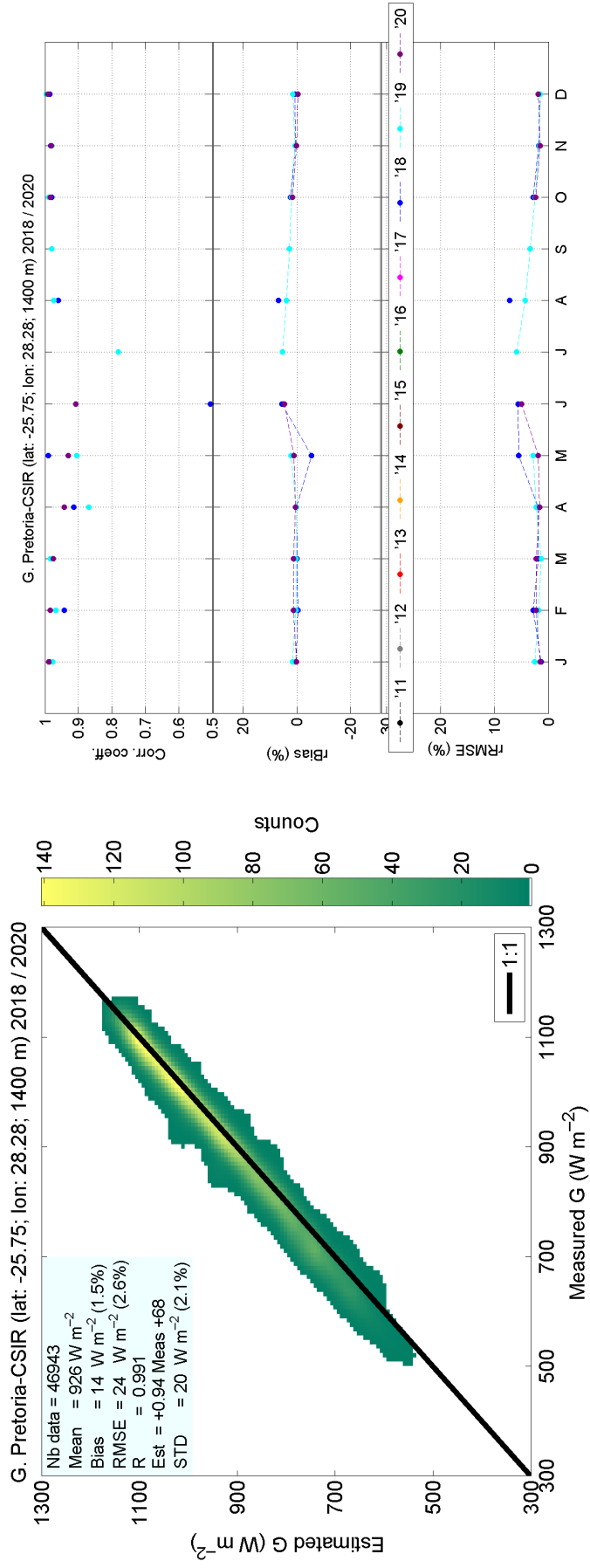


Figure S116: Comparison on direct clearness index at Gaborone



G. Pretoria-CSIR (lat: -25.75; lon: 28.28; 1400 m) 2018 / 2020

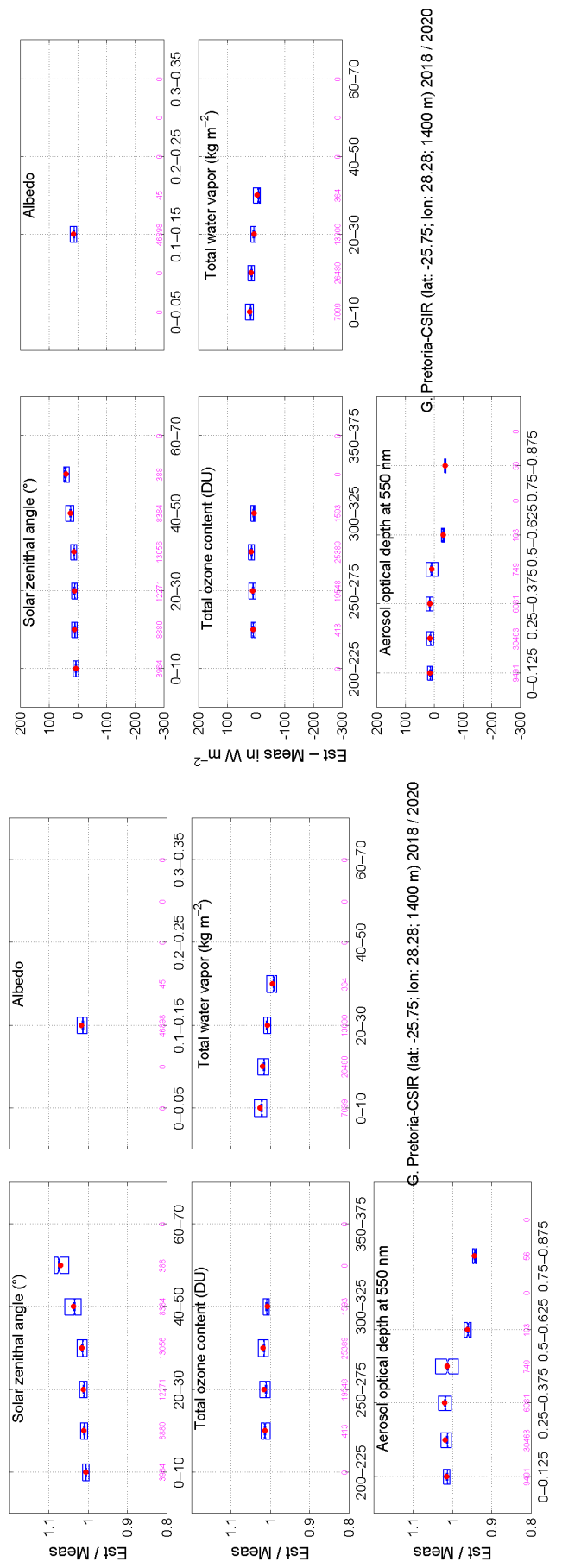
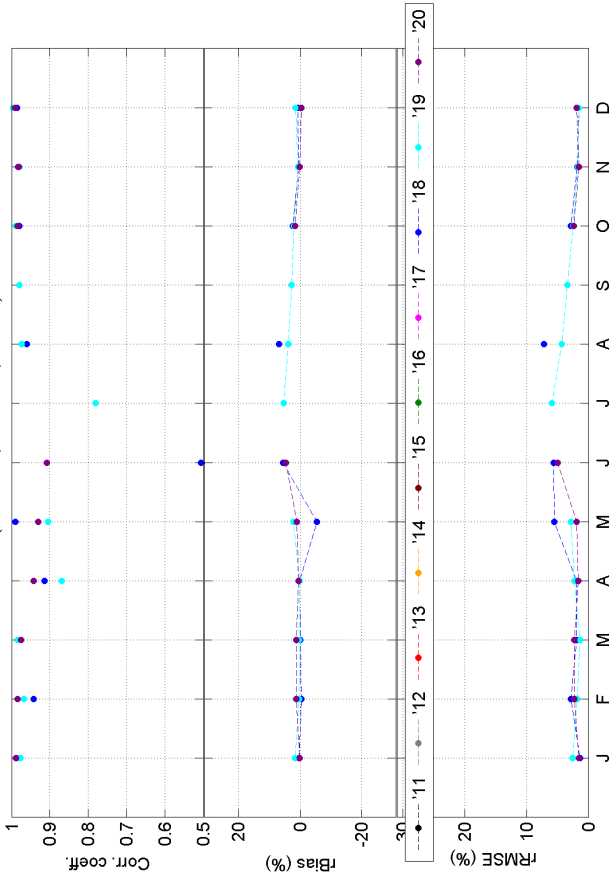


Figure S117: Comparison on global irradiance at Pretoria-CSIR

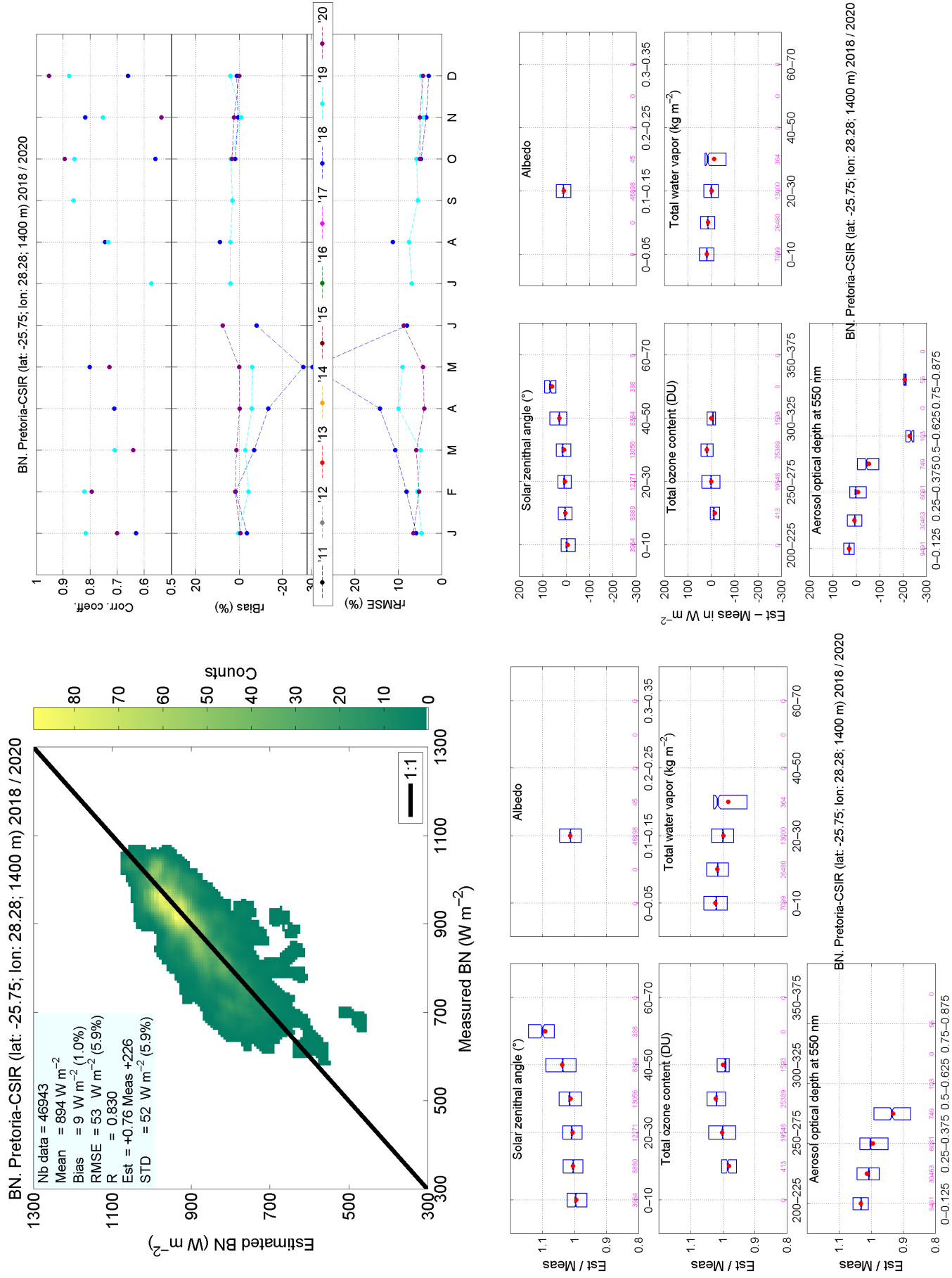


Figure S118: Comparison on direct component at normal irradiance at Pretoria-CSIR

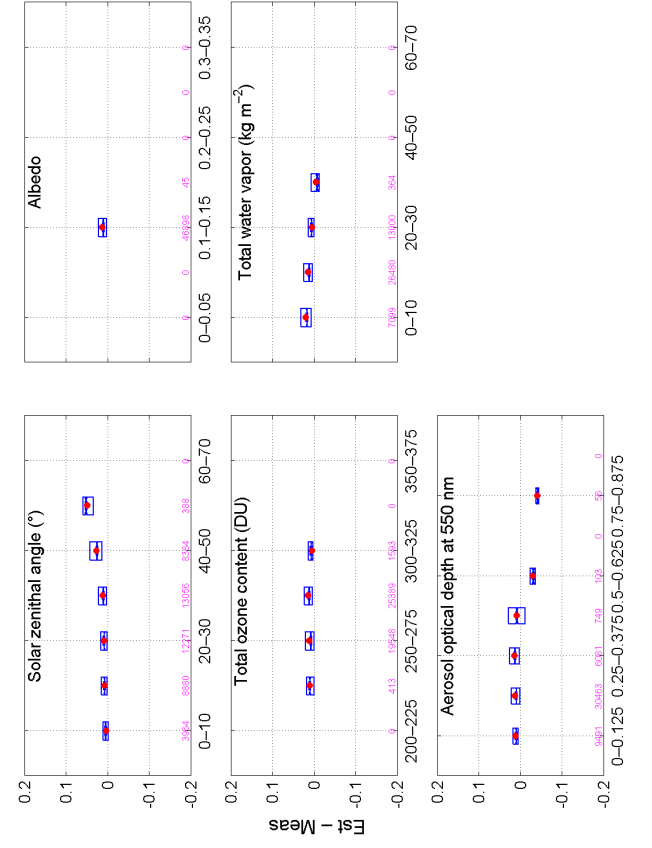
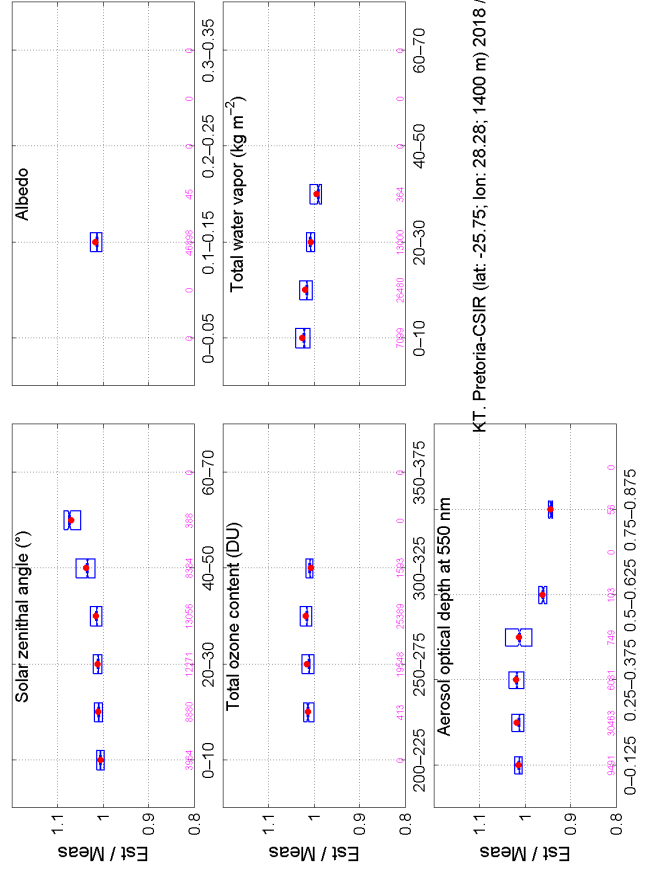
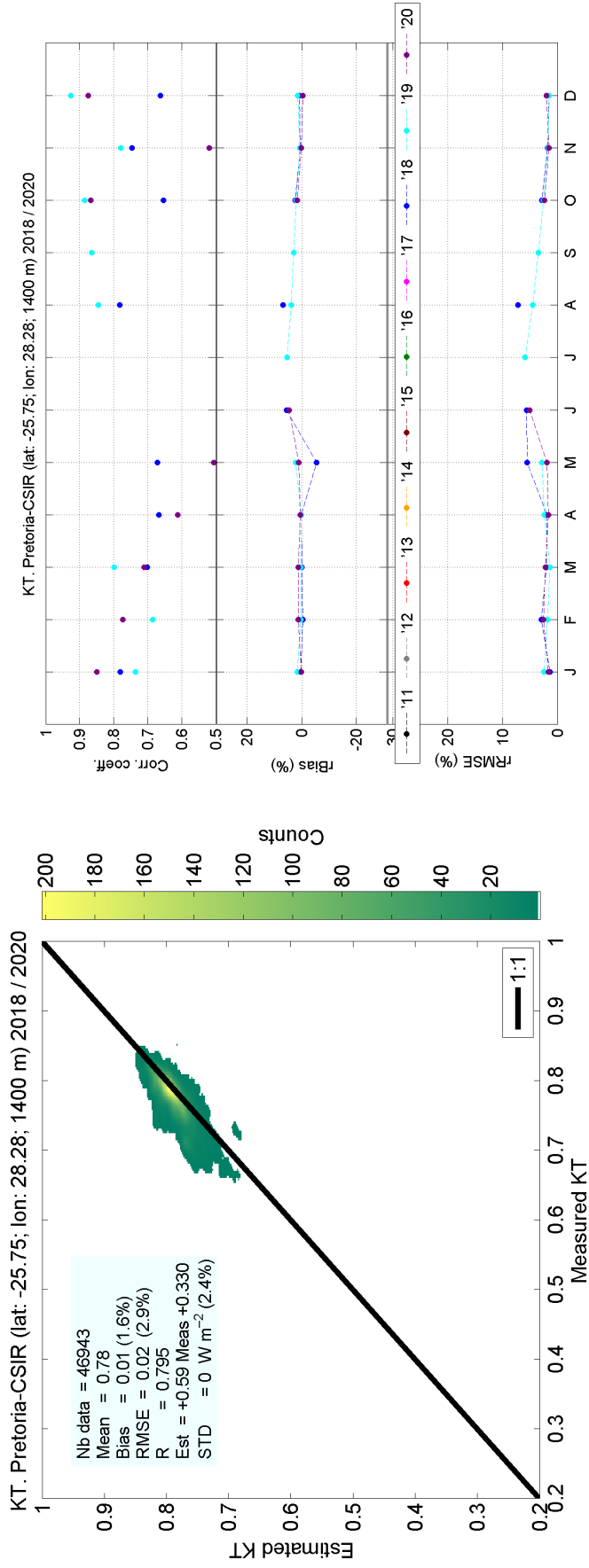


Figure S119: Comparison on clearness index at Pretoria-CSIR

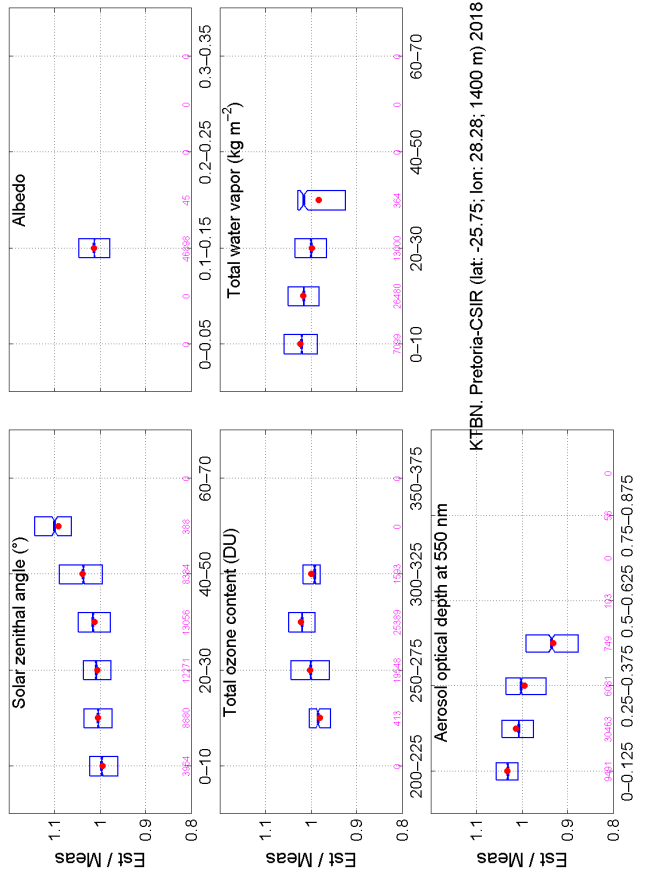
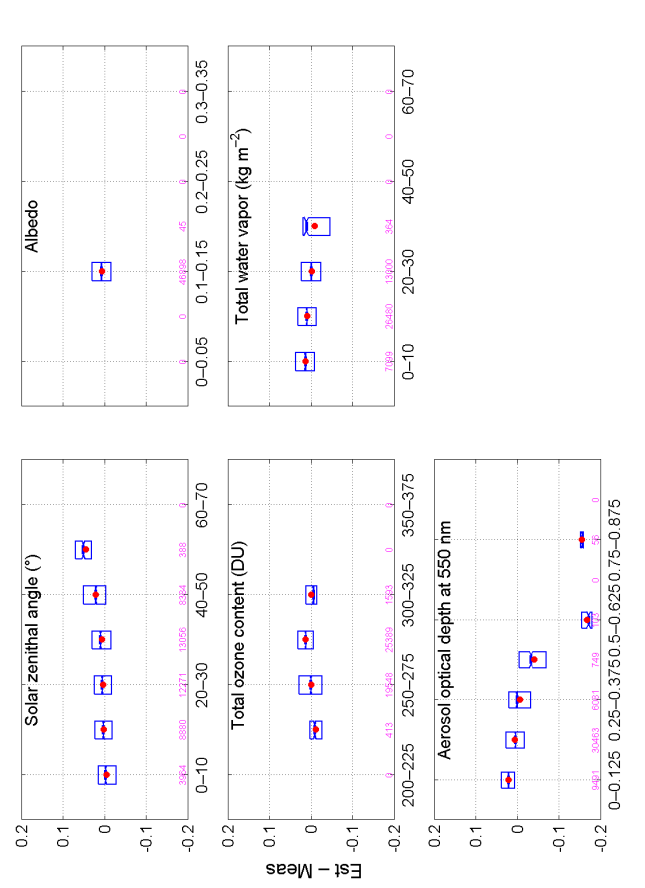
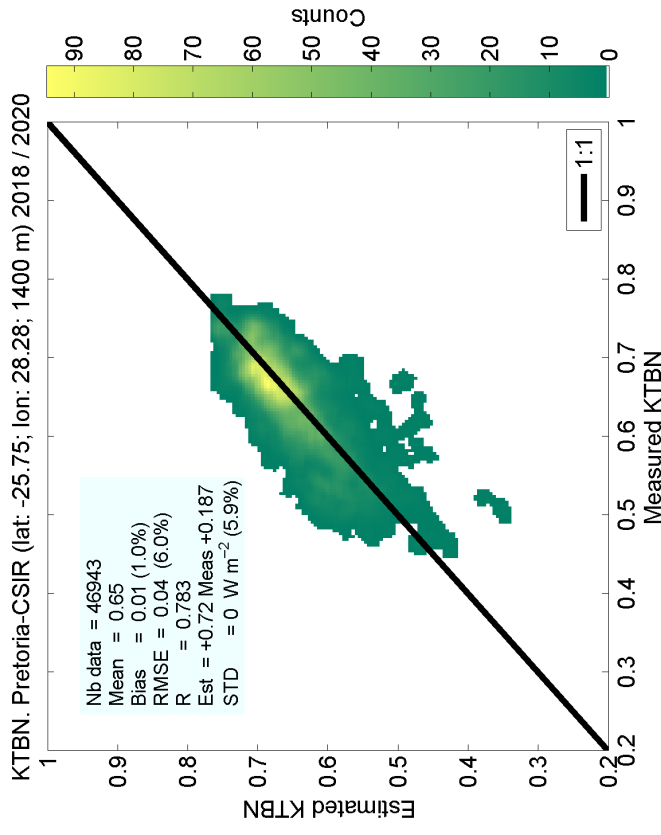
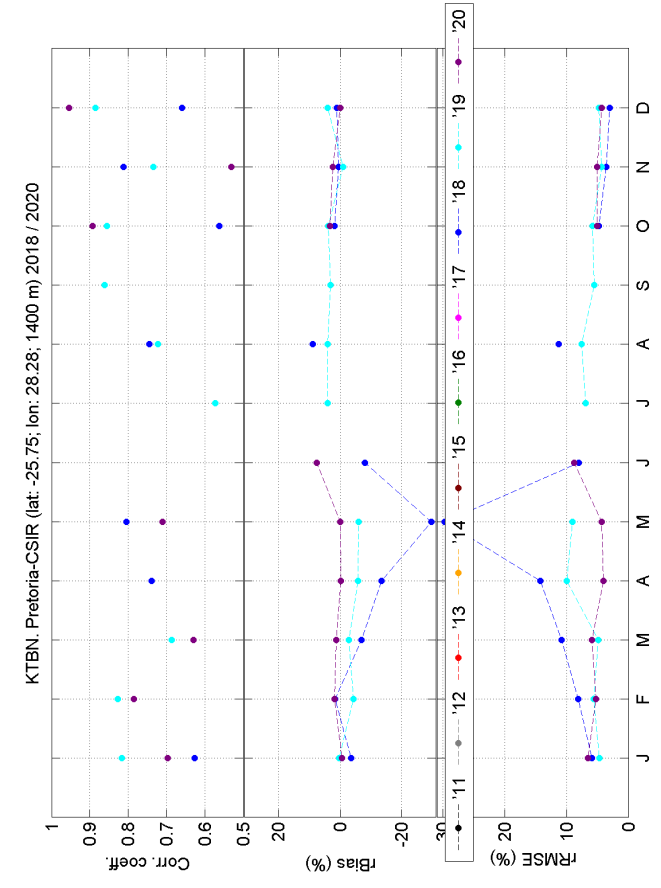


Figure S120: Comparison on direct clearness index at Pretoria-CSIR

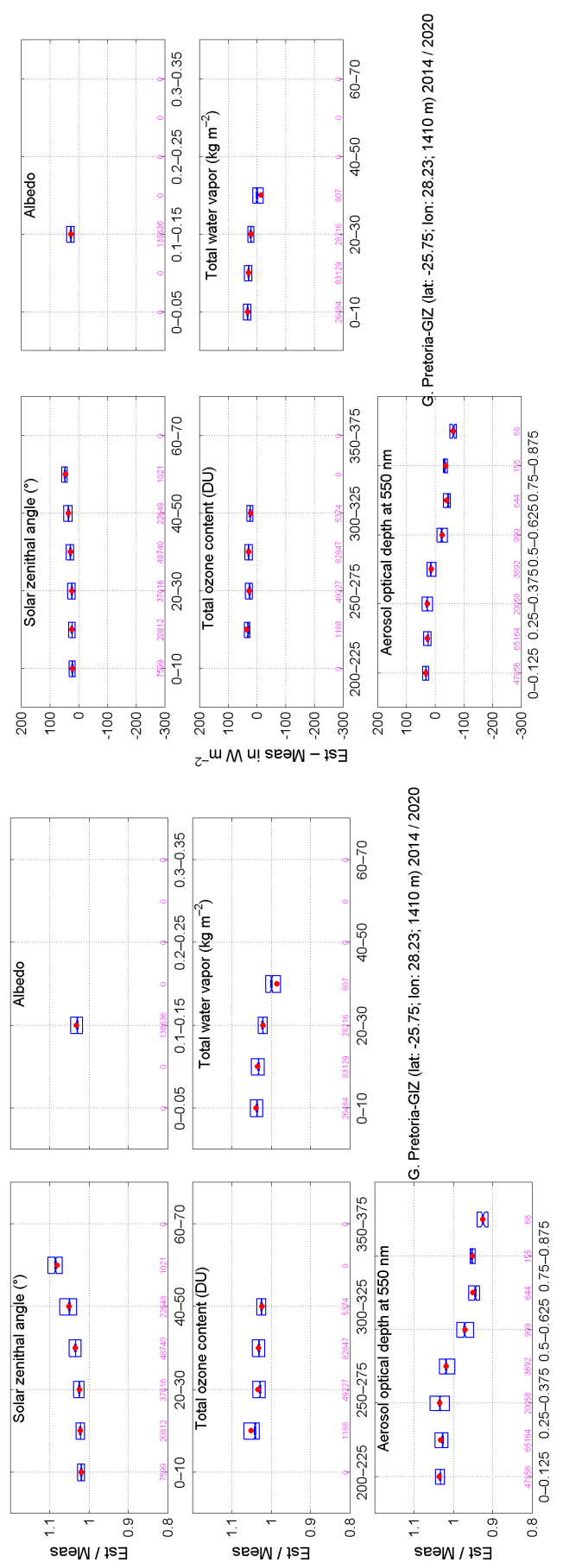
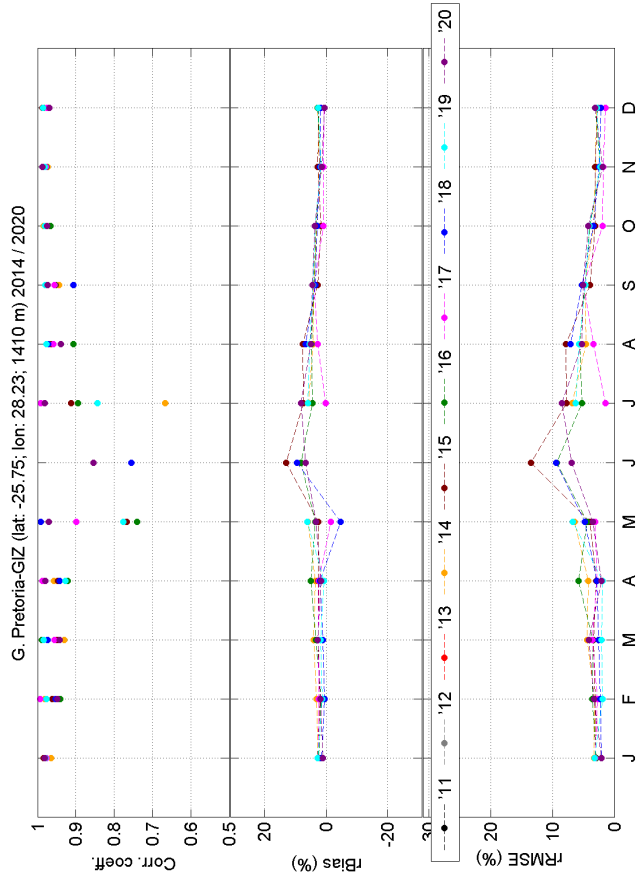
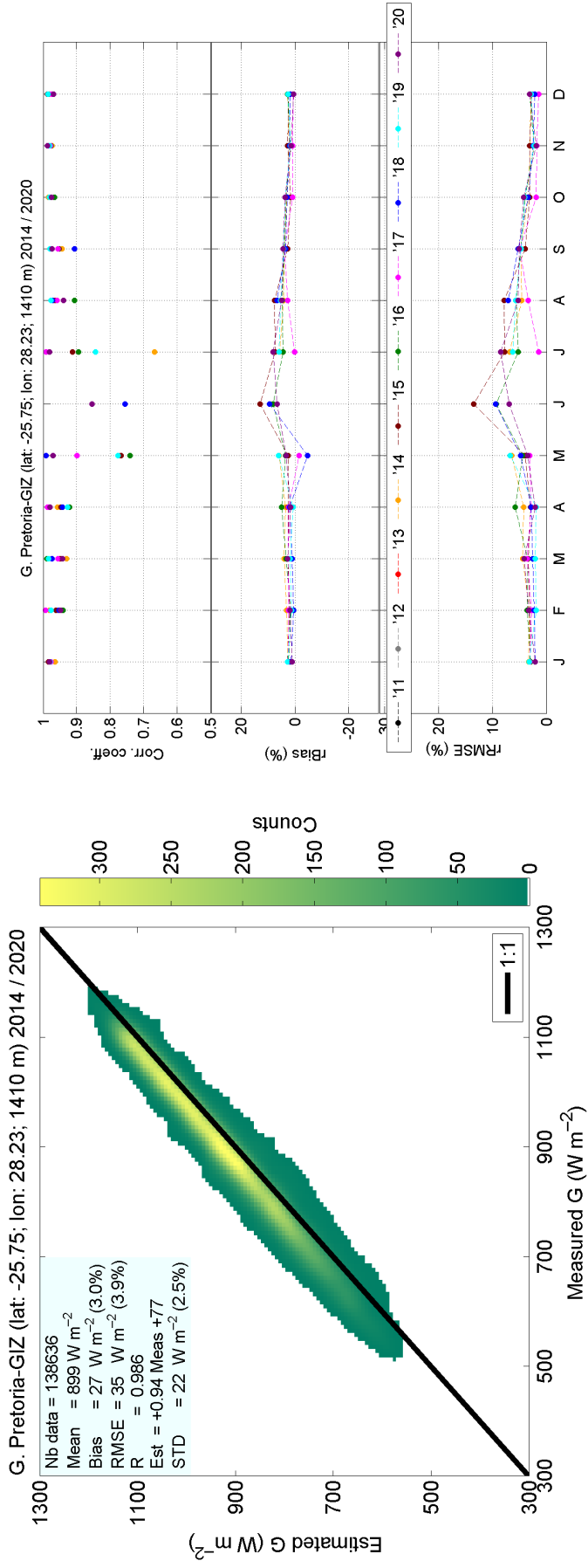


Figure S121: Comparison on global irradiance at Pretoria-GIZ

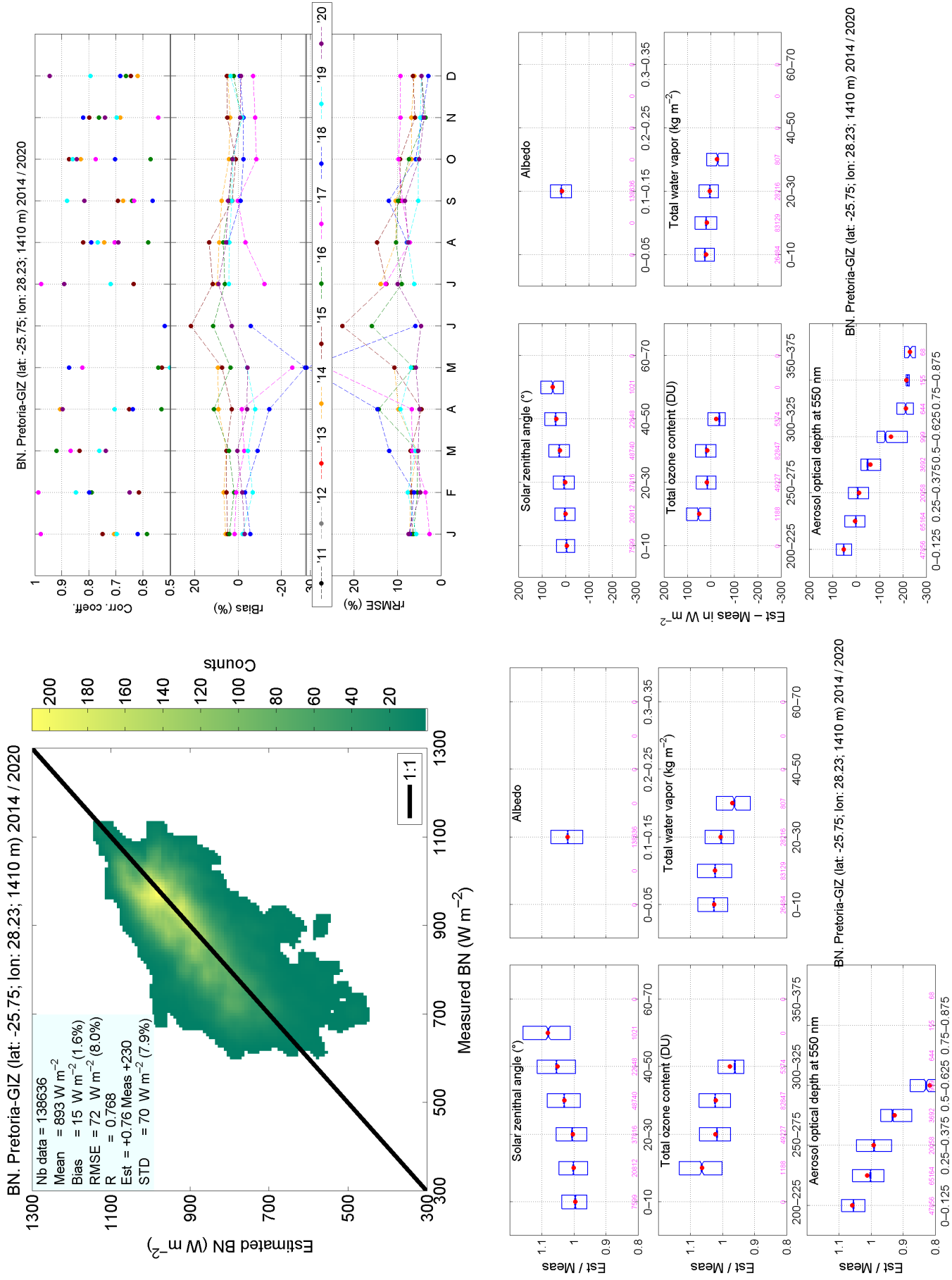


Figure S122: Comparison on direct component at Pretoria-GIZ

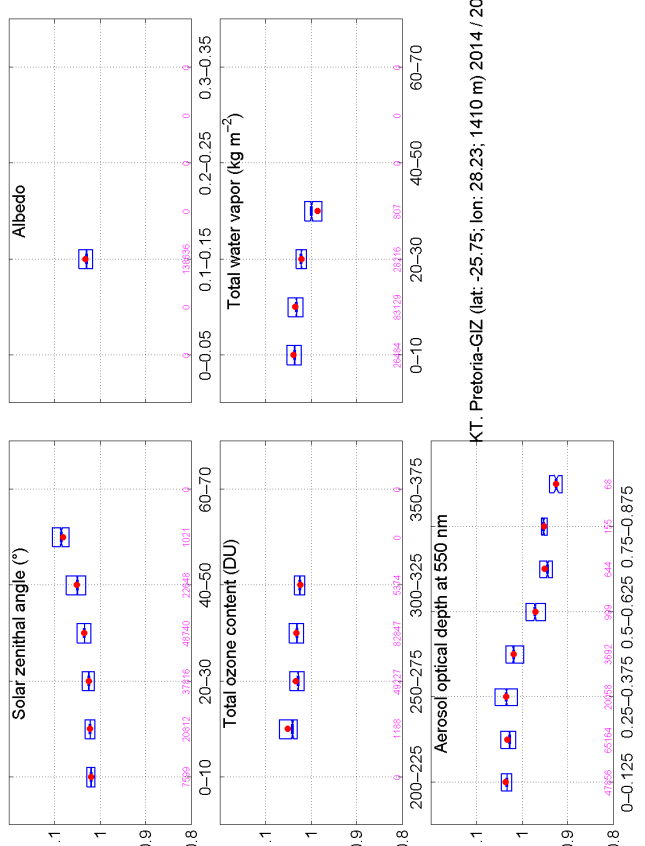
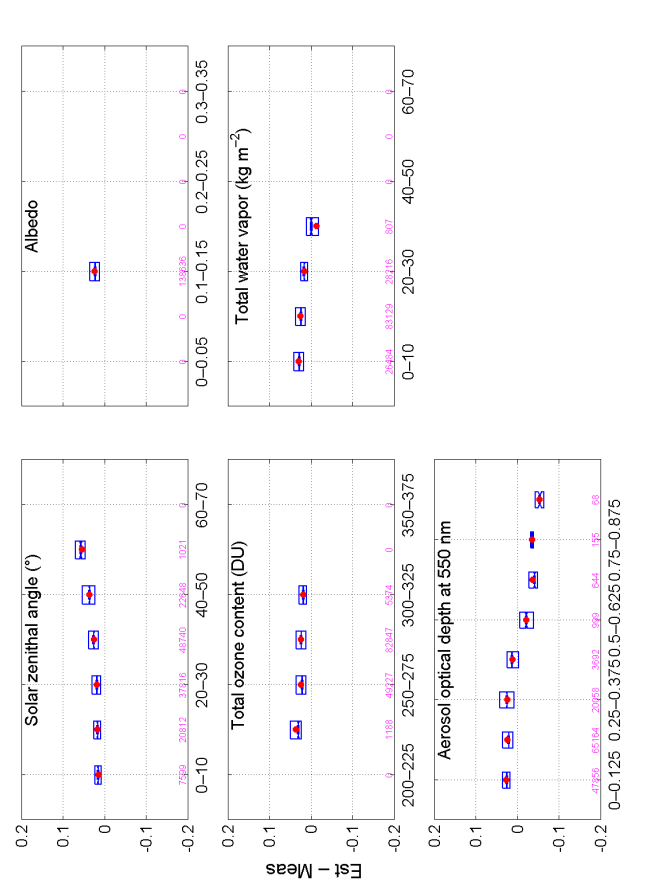
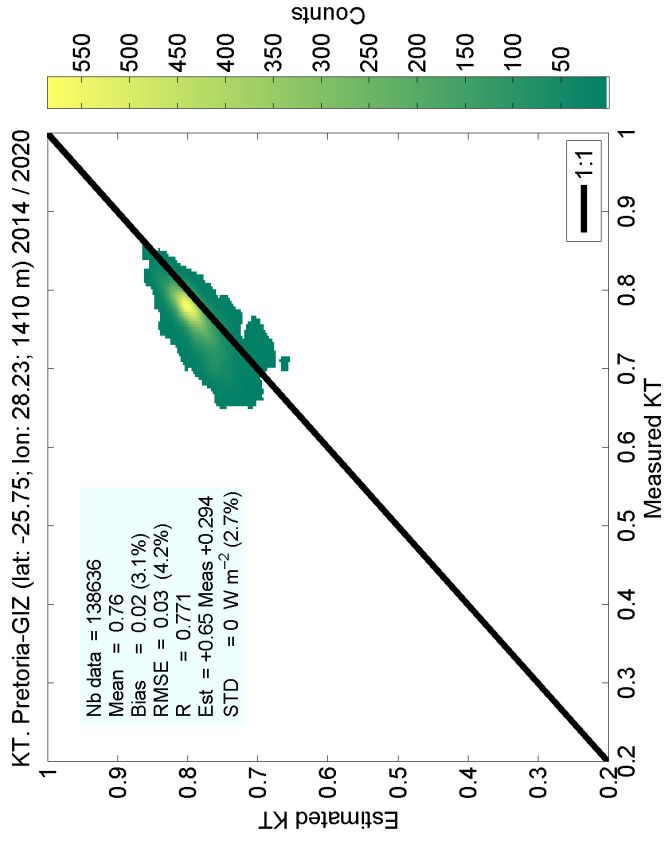
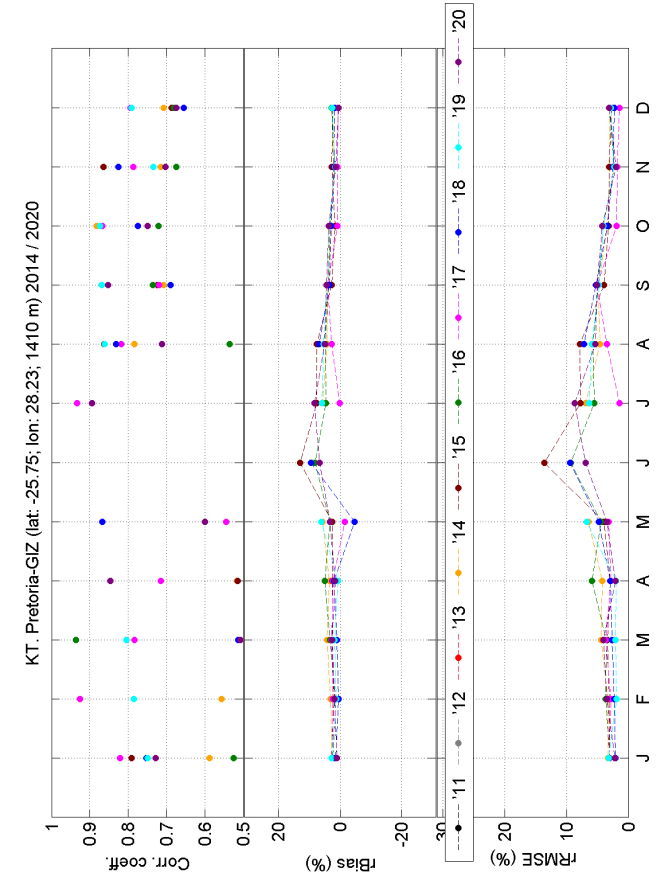


Figure S123: Comparison on clearness index at Pretoria-GIZ

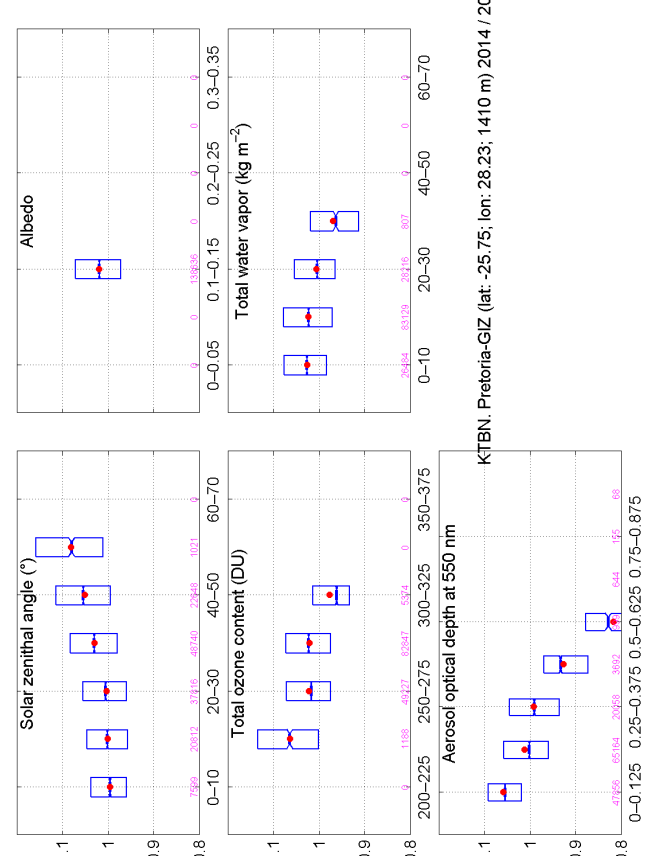
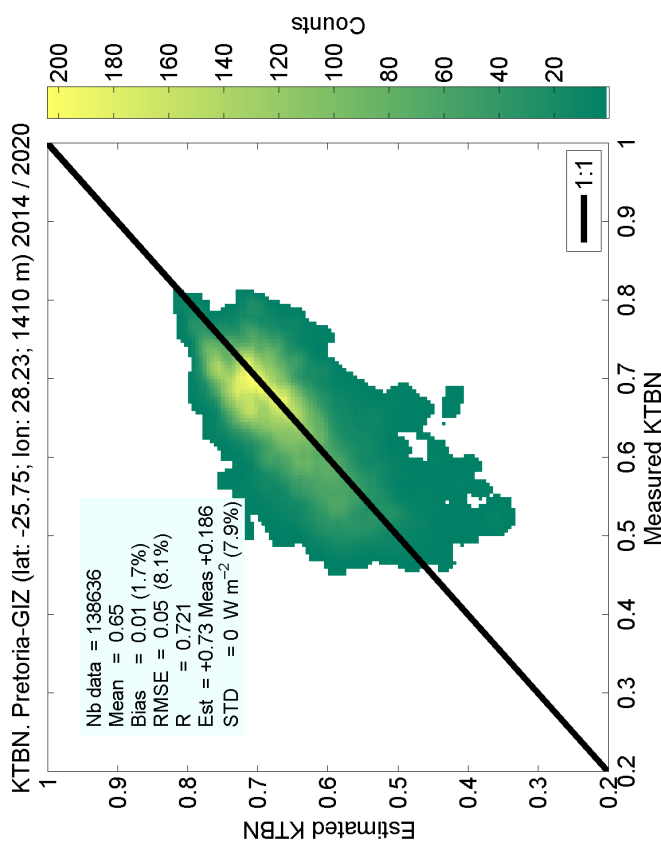
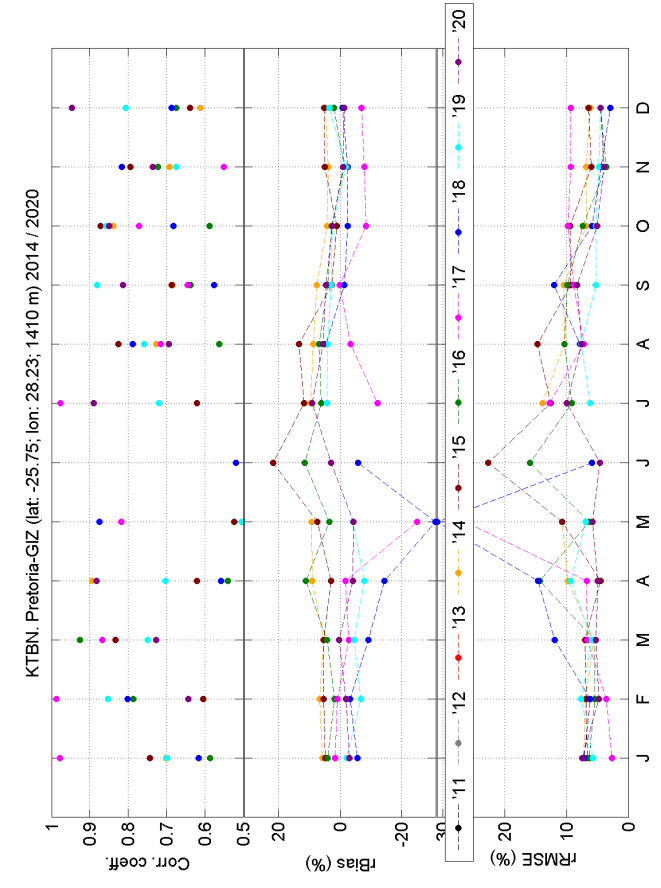


Figure S124: Comparison on direct clearness index at Pretoria-GIZ

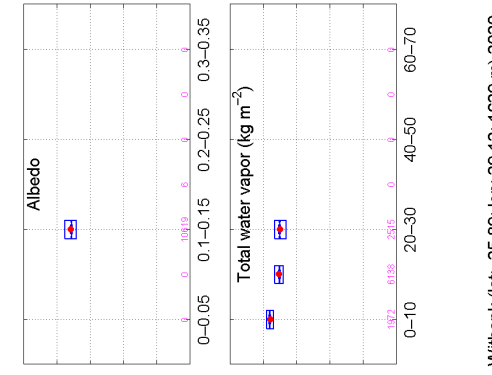
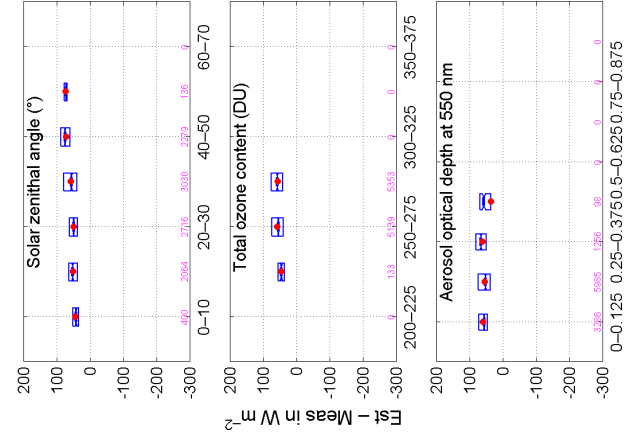
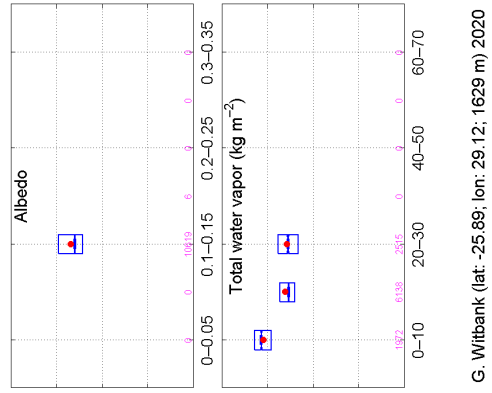
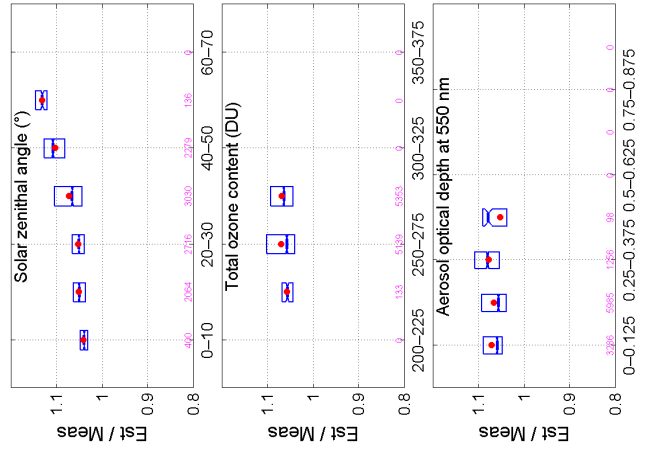
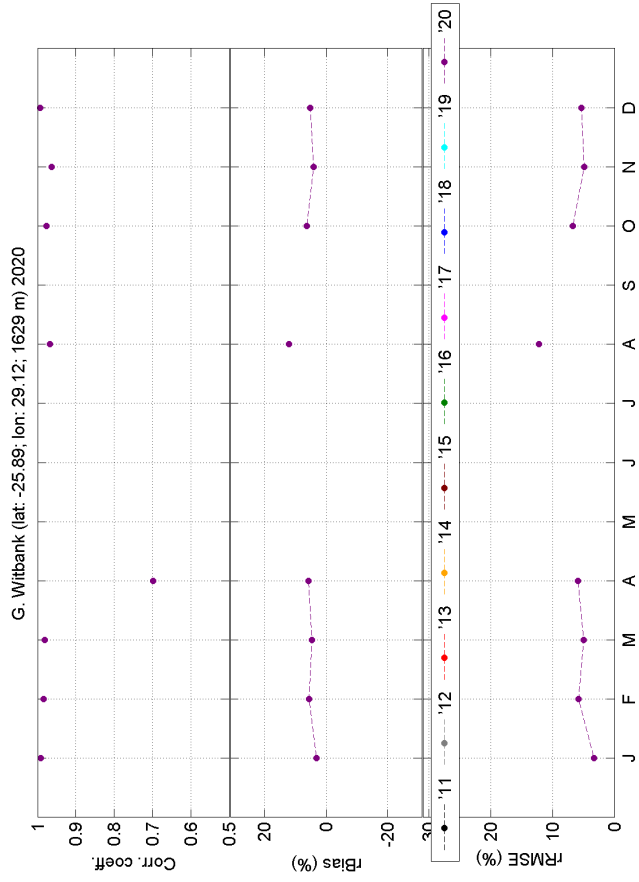
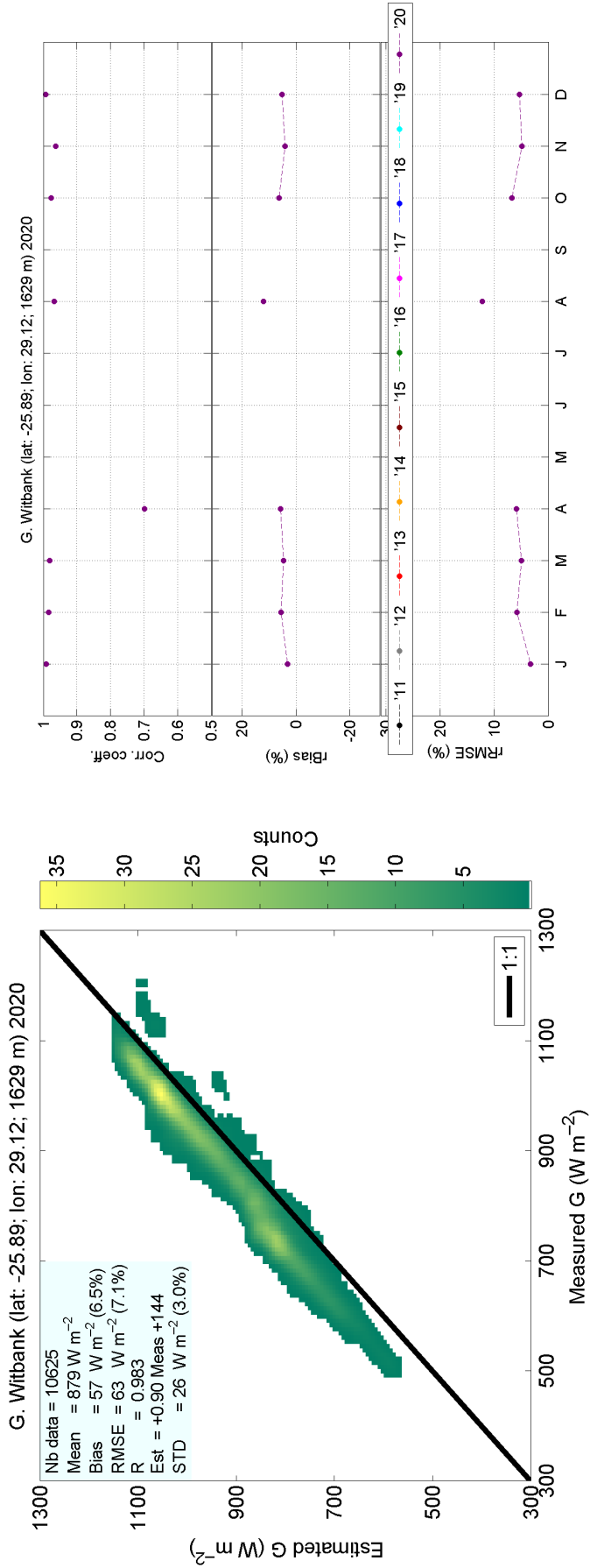


Figure S125: Comparison on global irradiance at Witbank

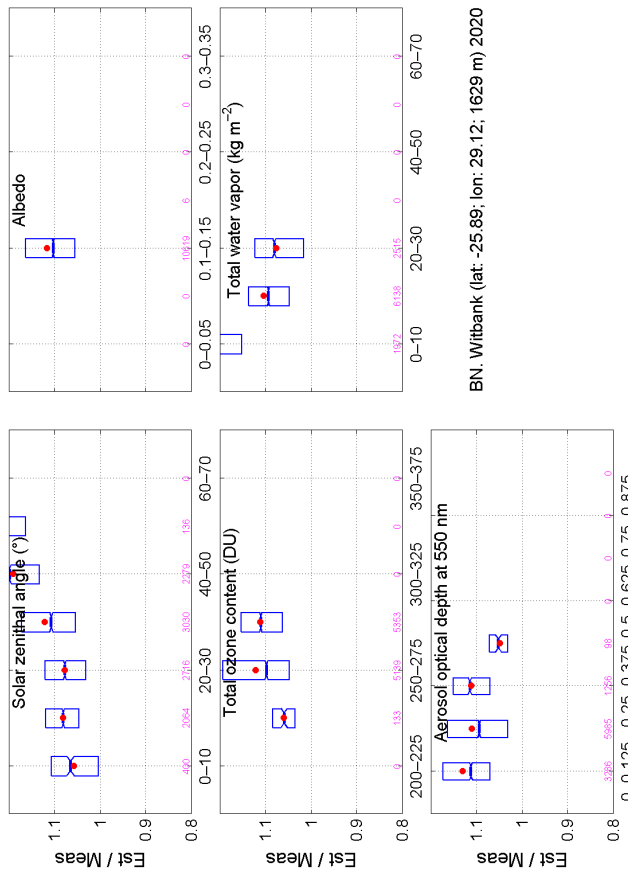
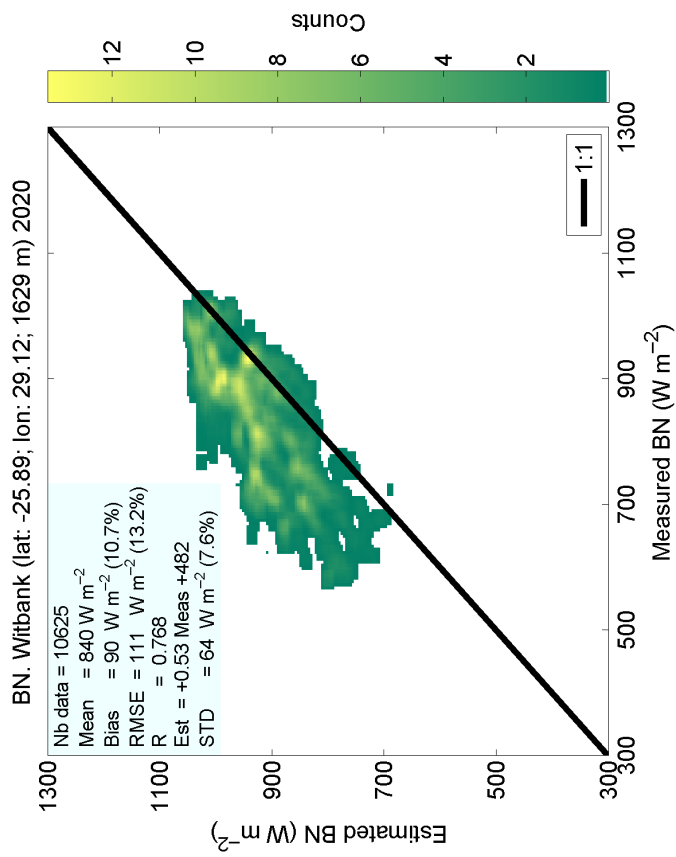
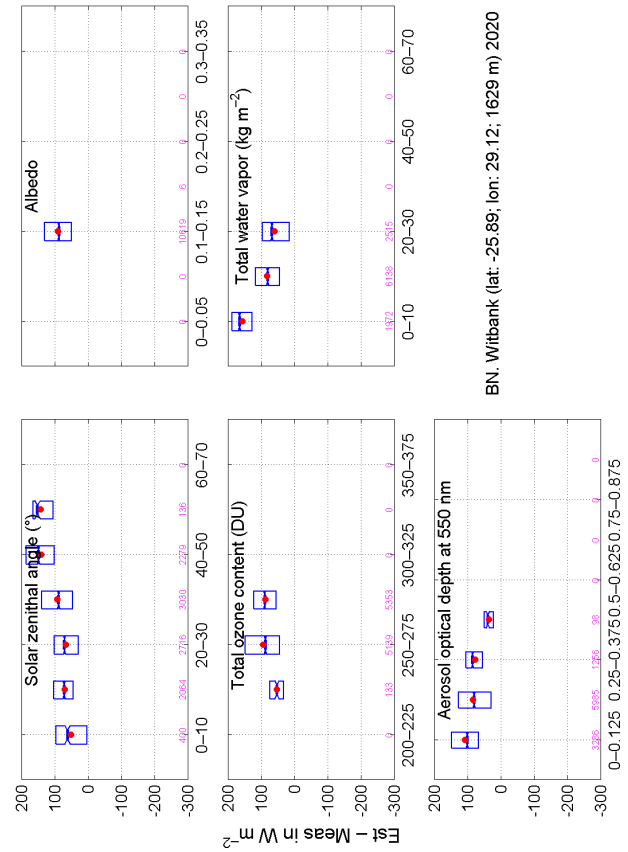
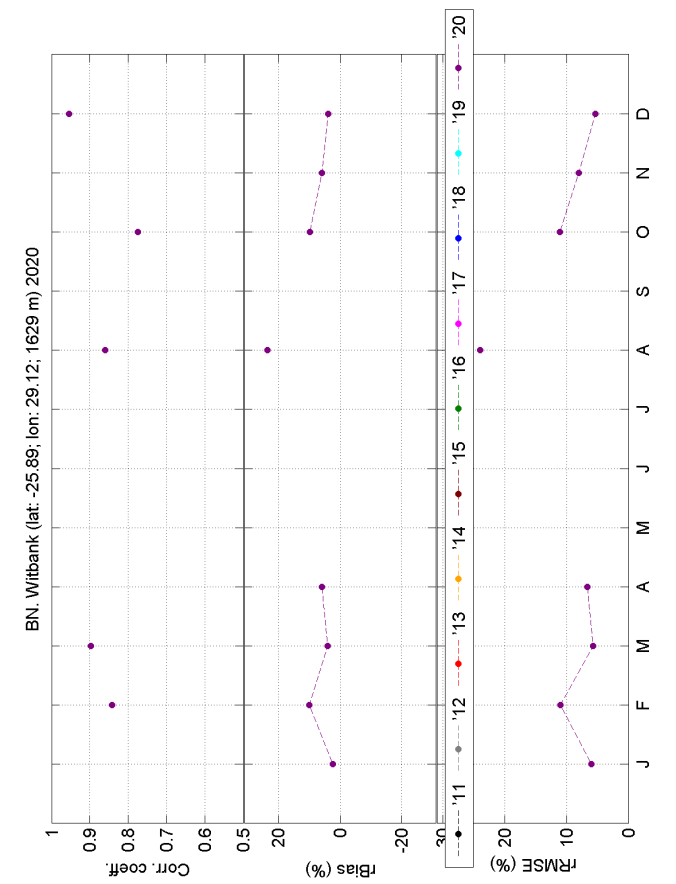


Figure S126: Comparison on direct component at normal irradiance at Witbank

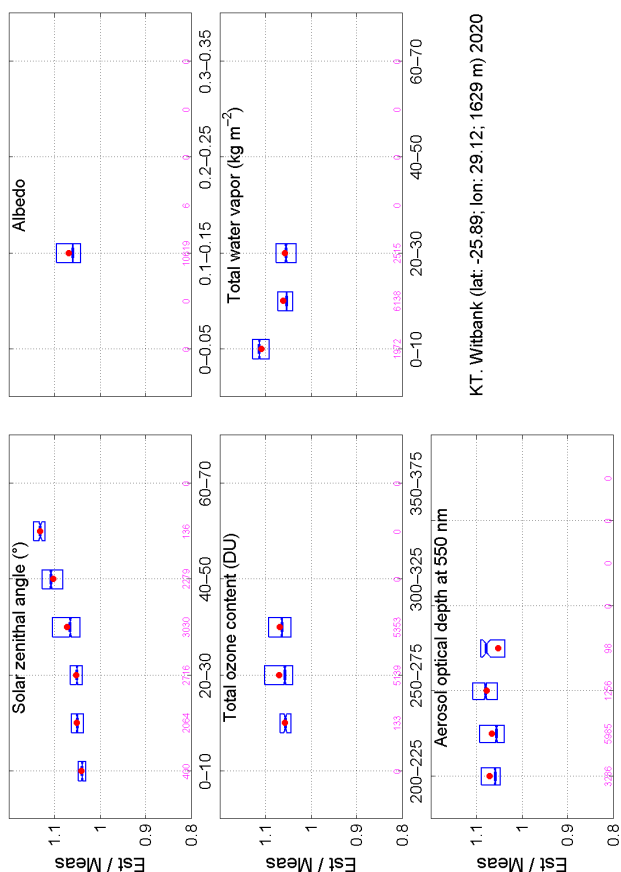
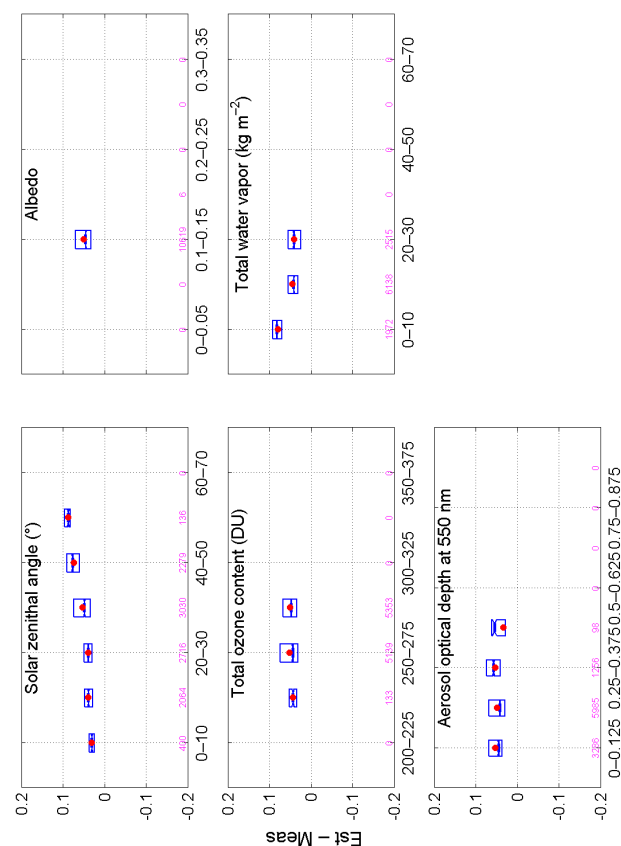
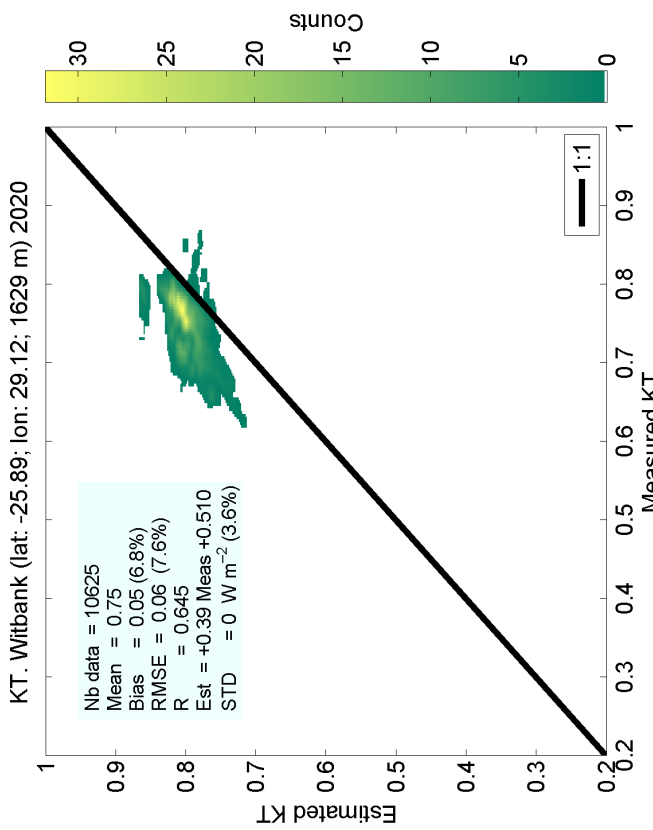
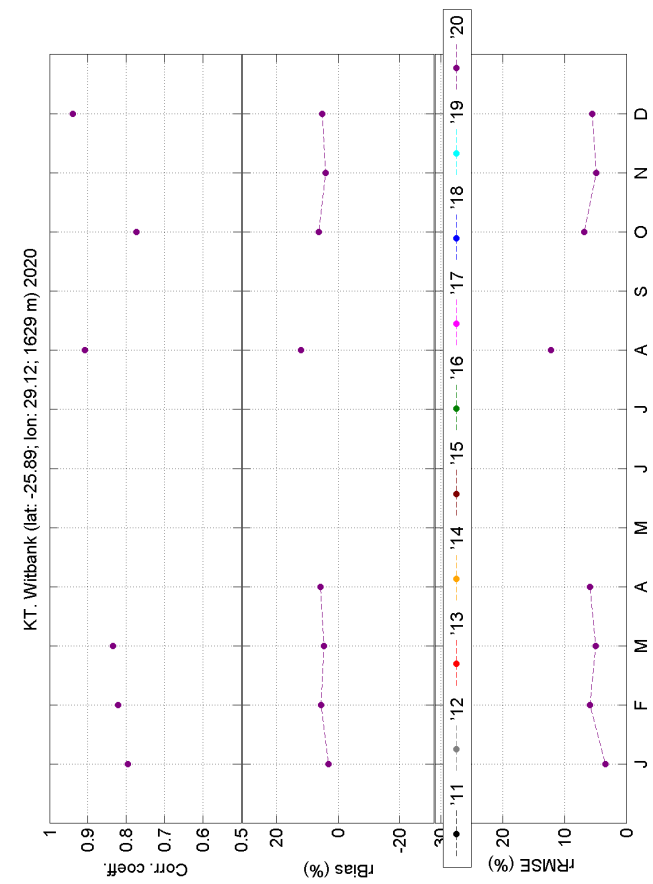


Figure S127: Comparison on clearness index at Witbank

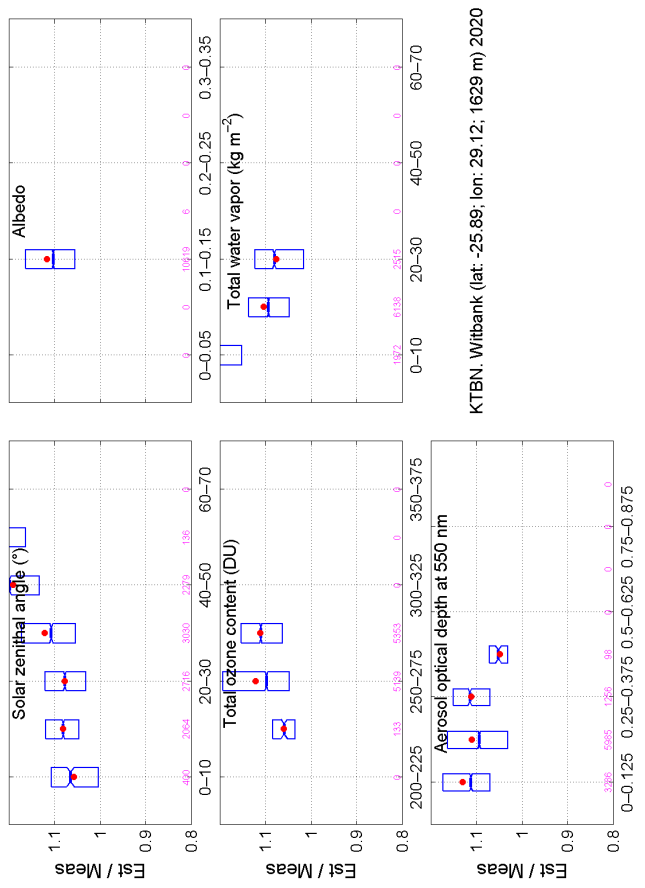
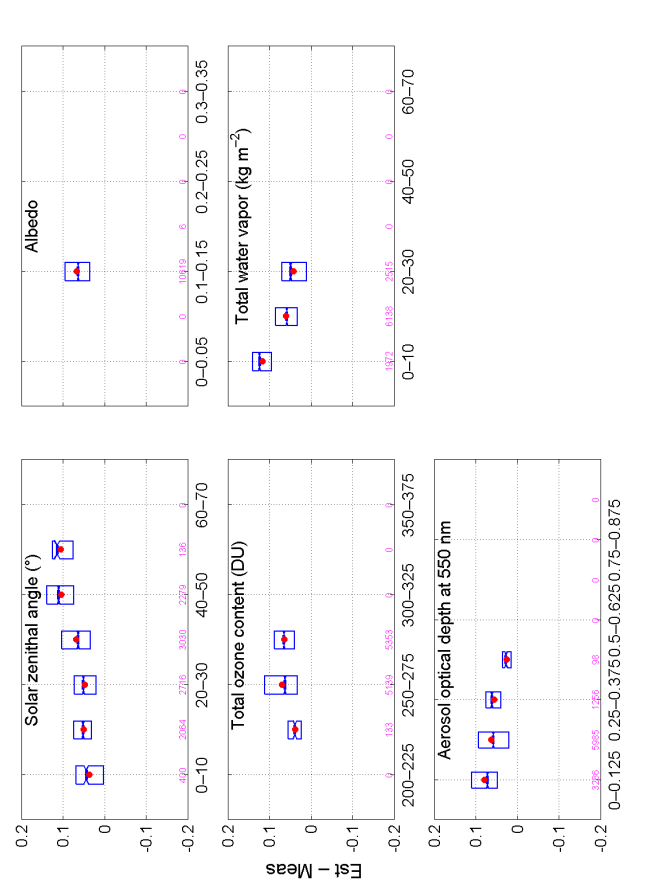
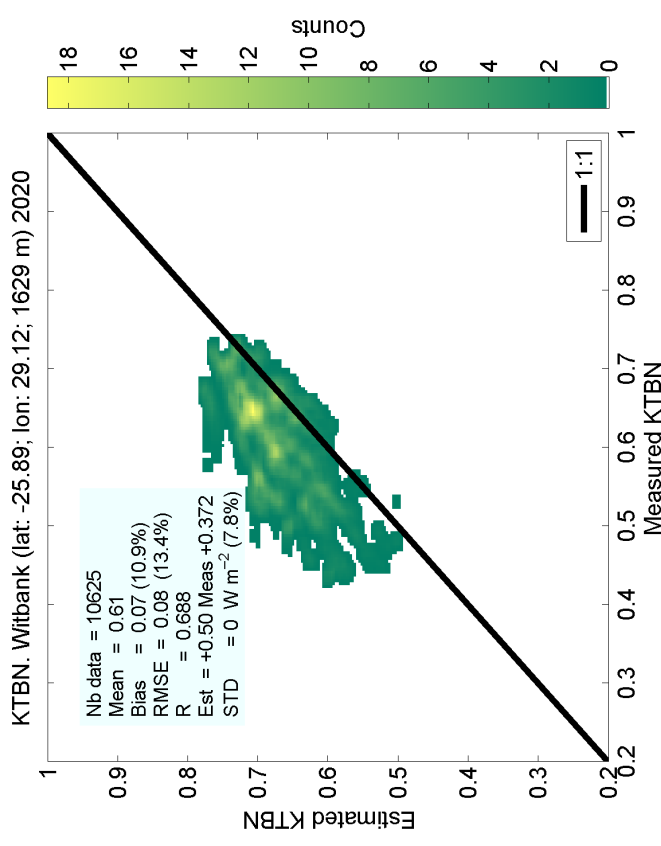
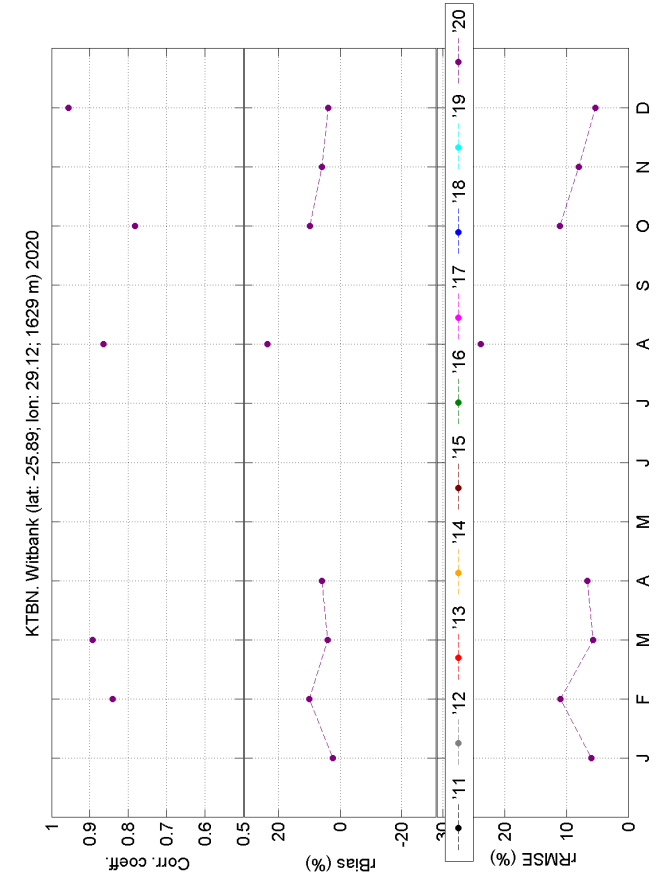


Figure S128: Comparison on direct clearness index at Witbank

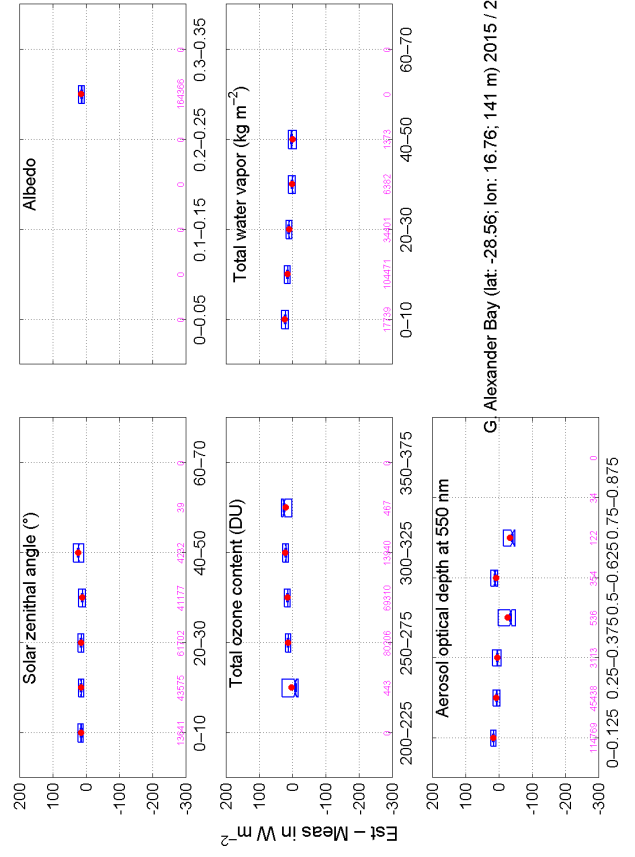
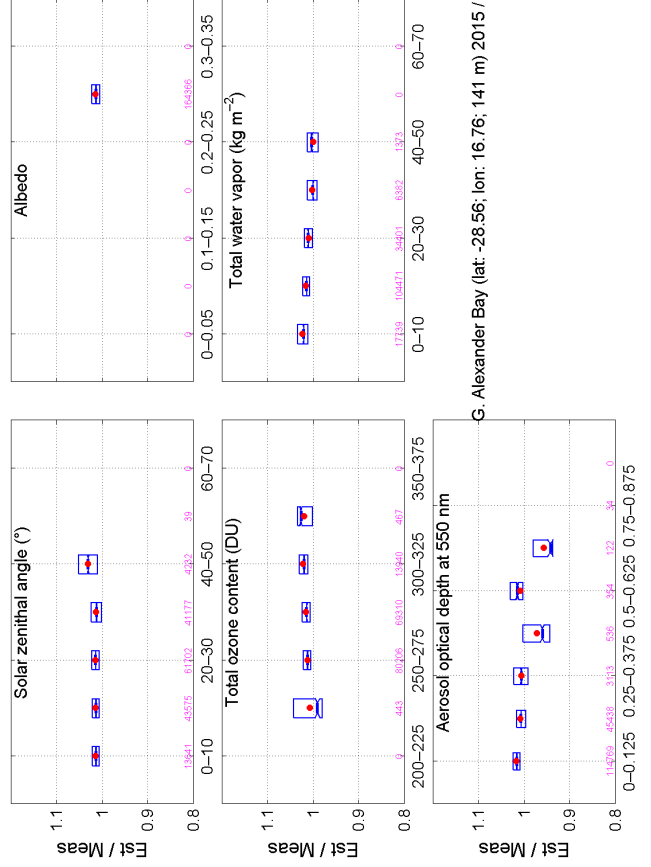
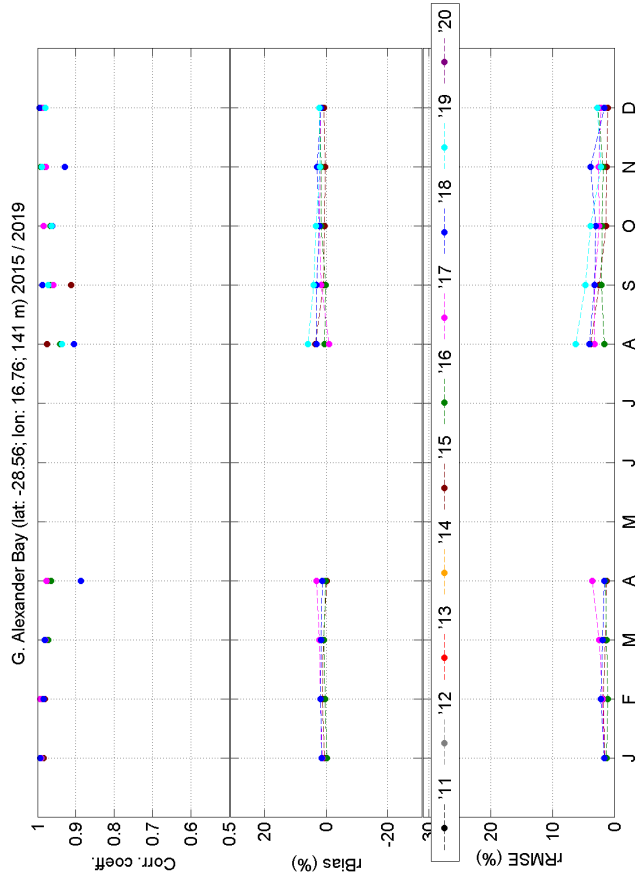
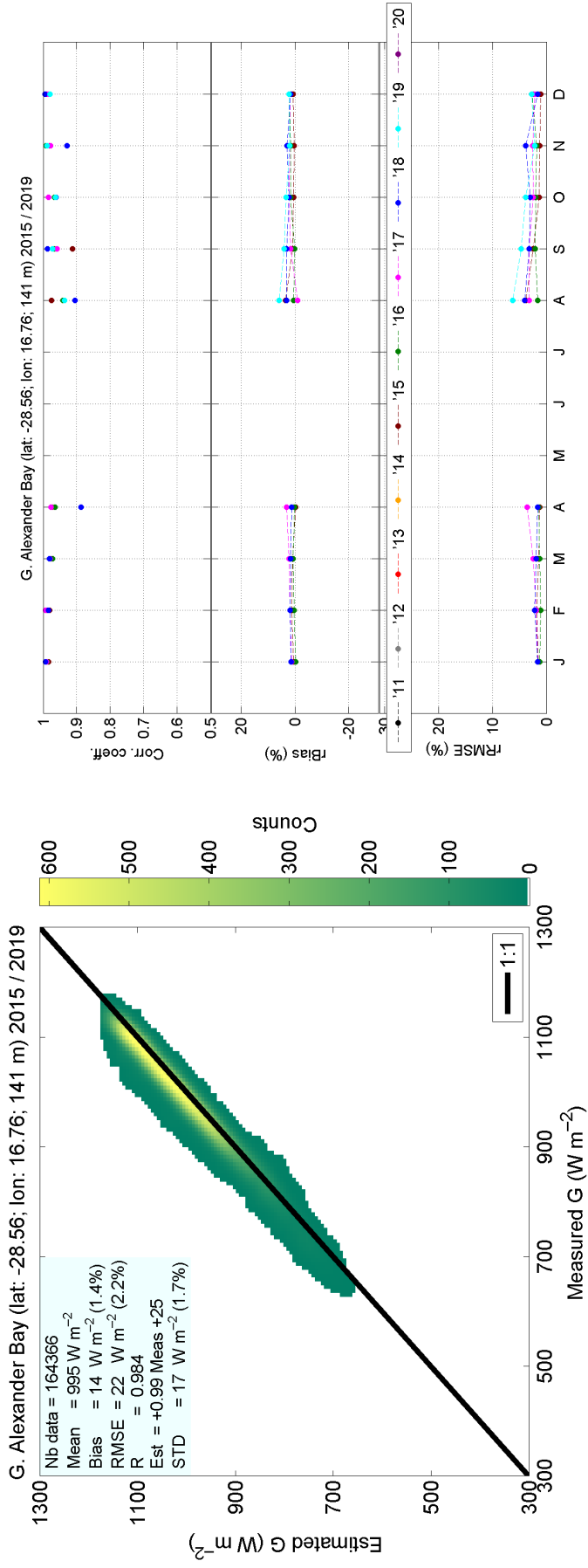


Figure S129: Comparison on global irradiance at Alexander Bay

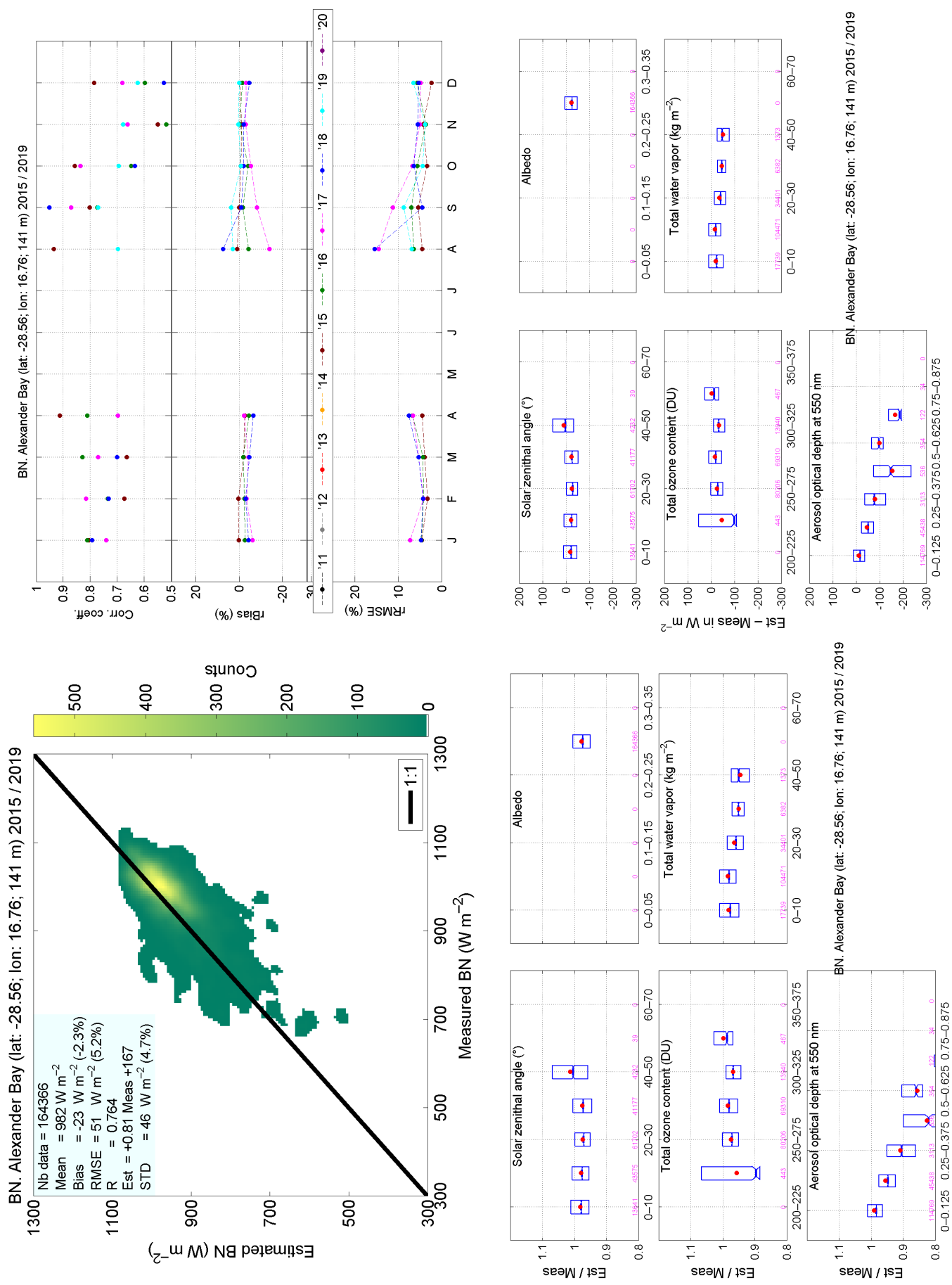


Figure S130: Comparison on direct component at normal irradiance at Alexander Bay

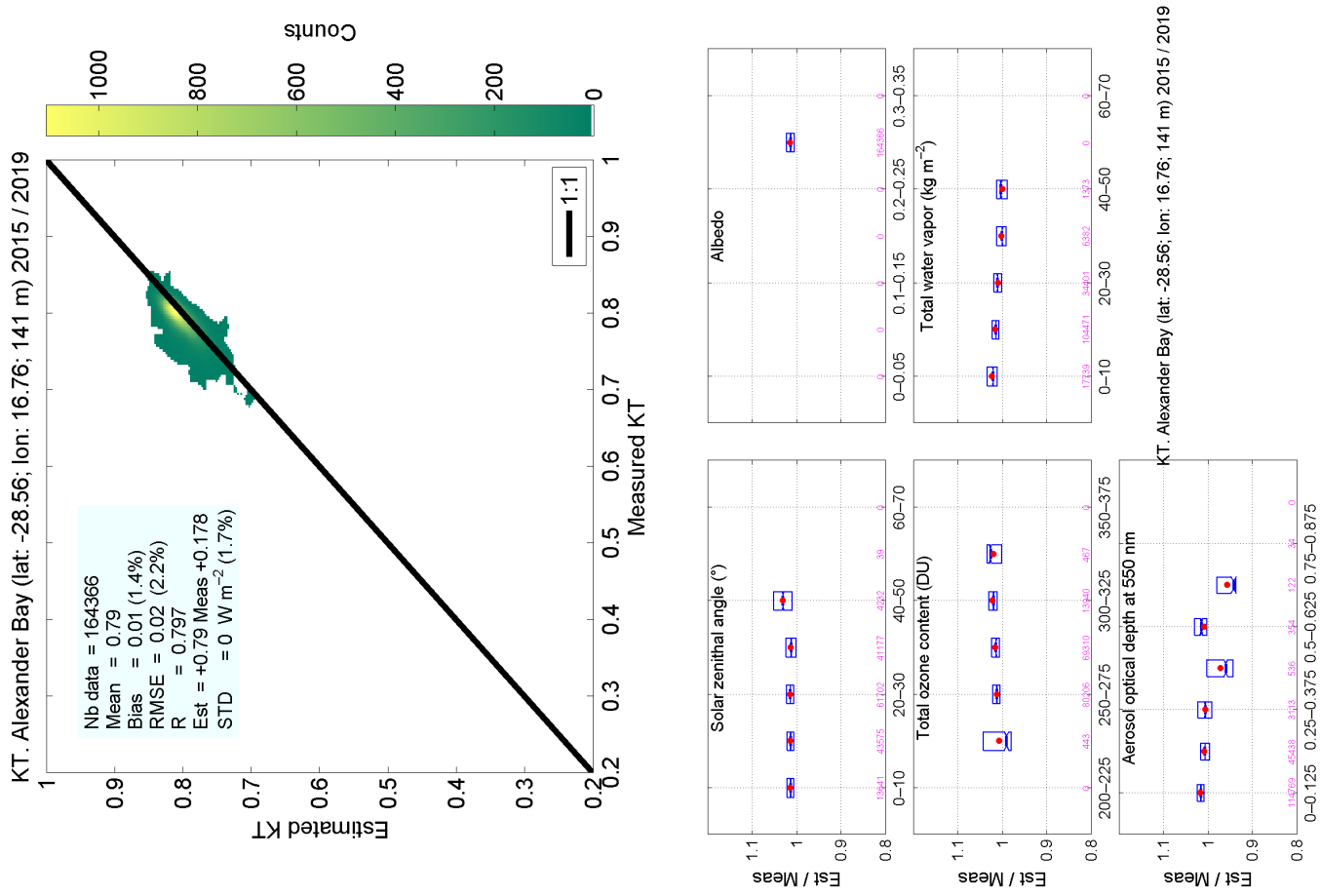
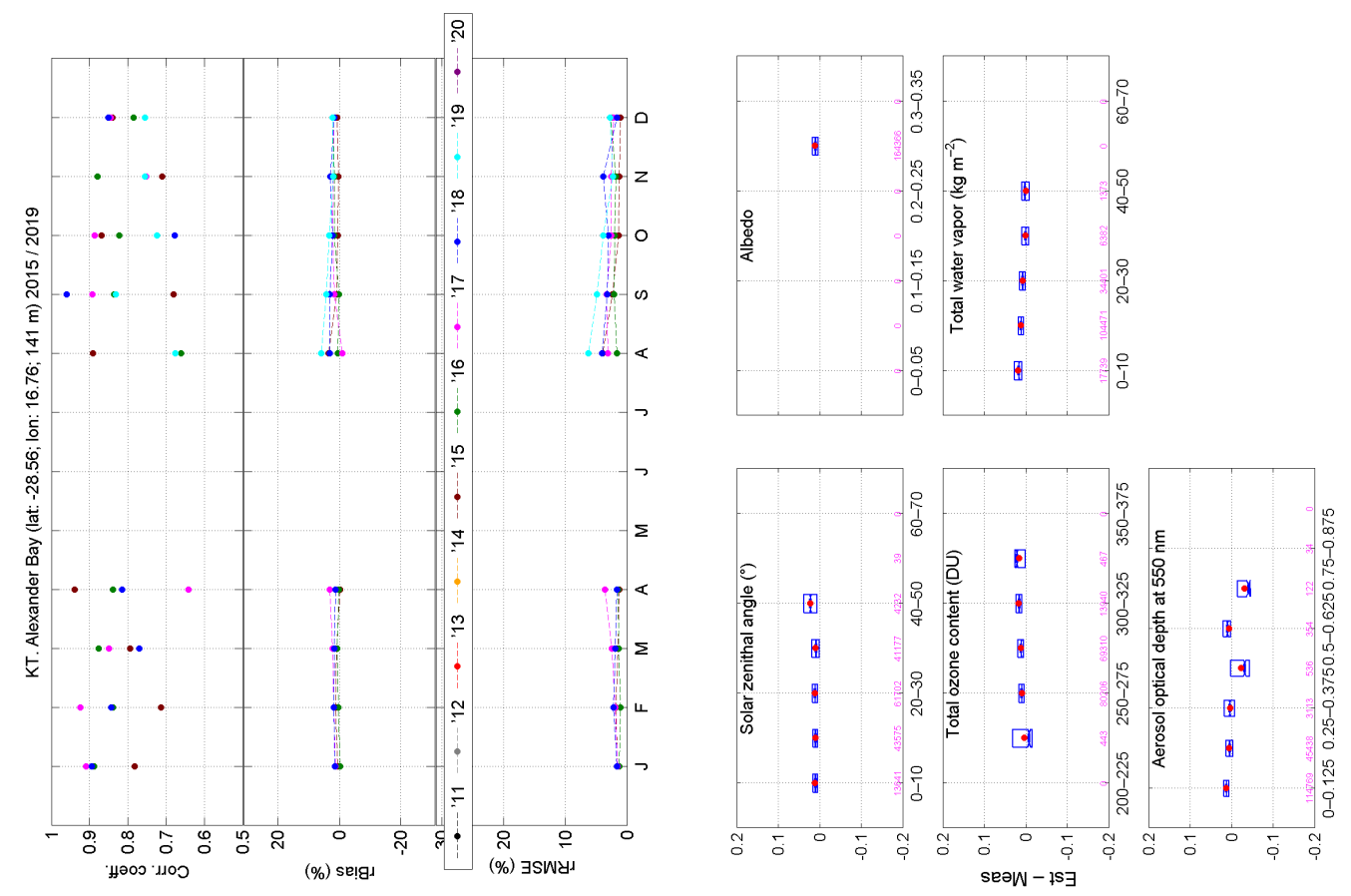


Figure S131: Comparison on clearness index at Alexander Bay

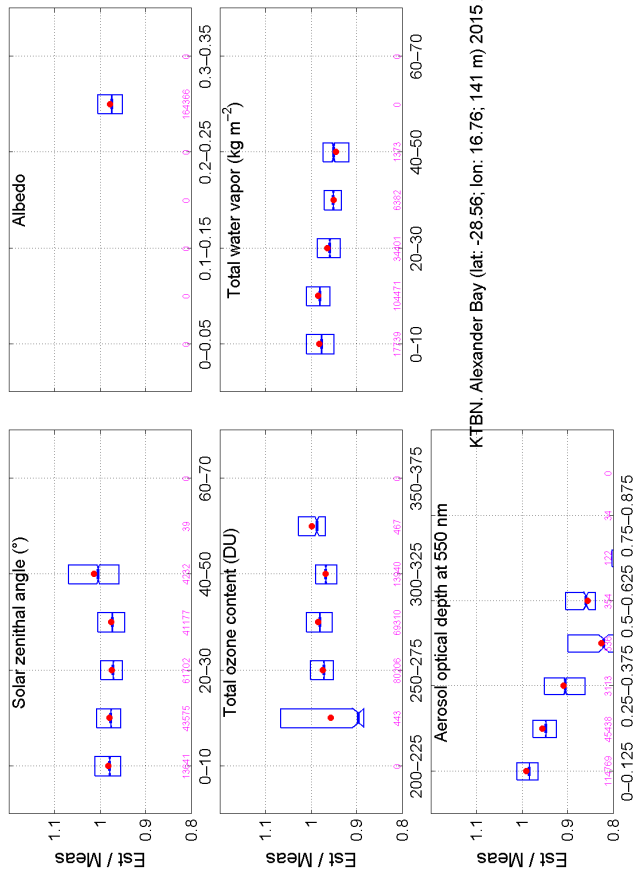
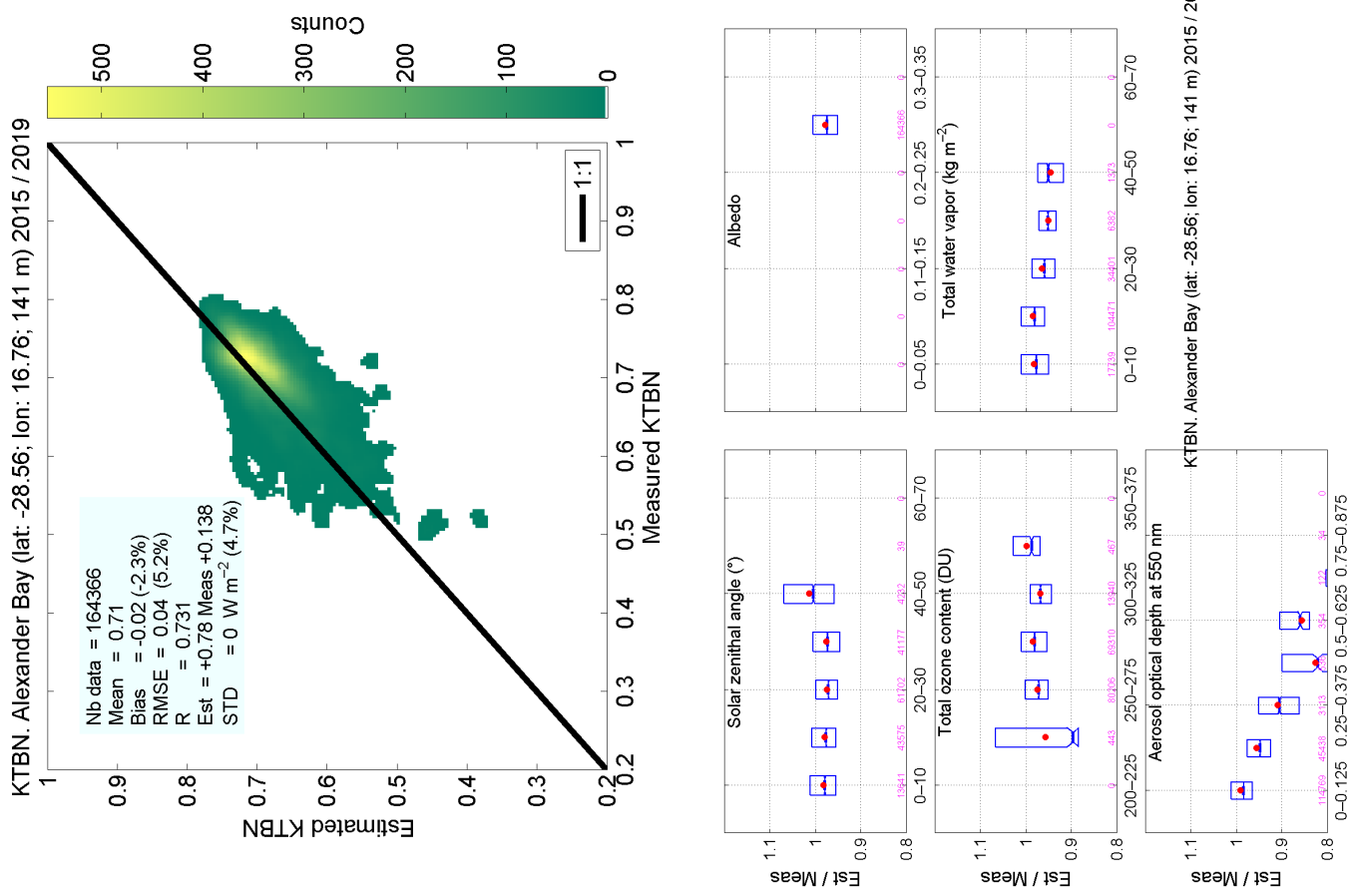
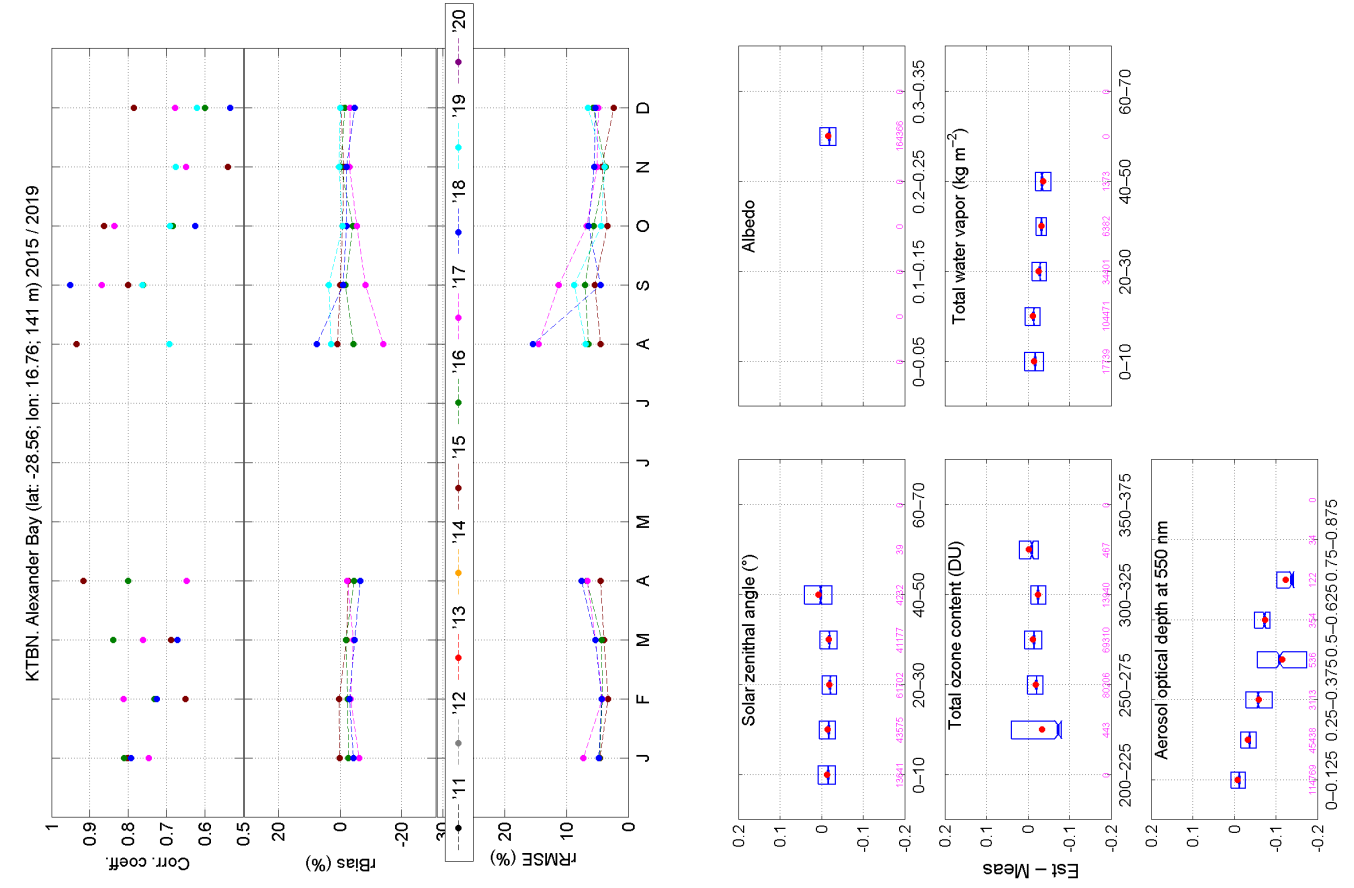
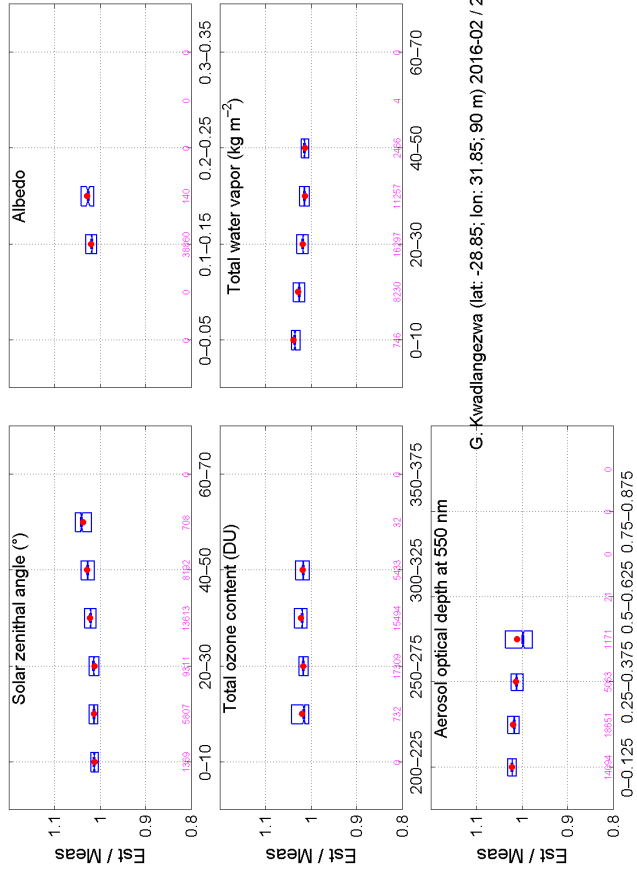
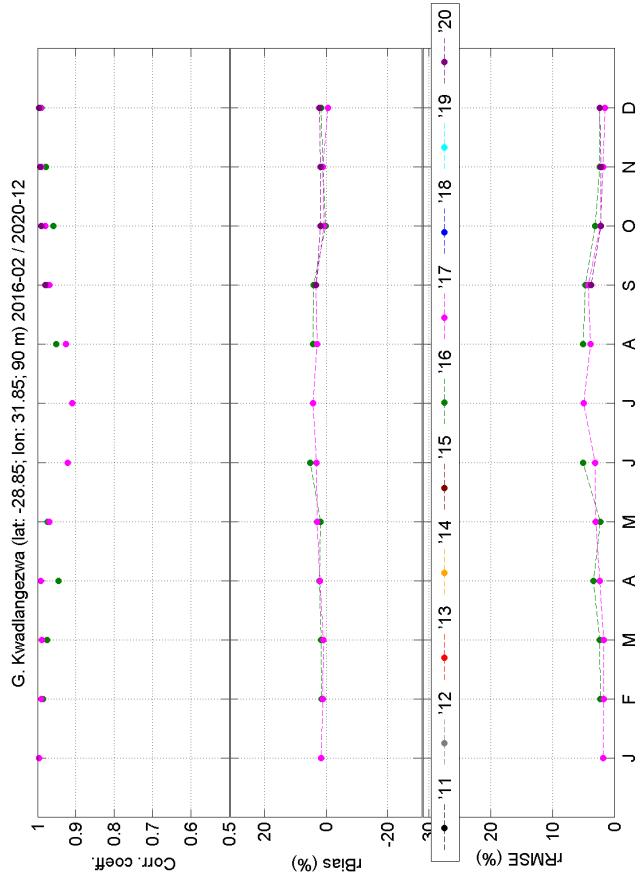
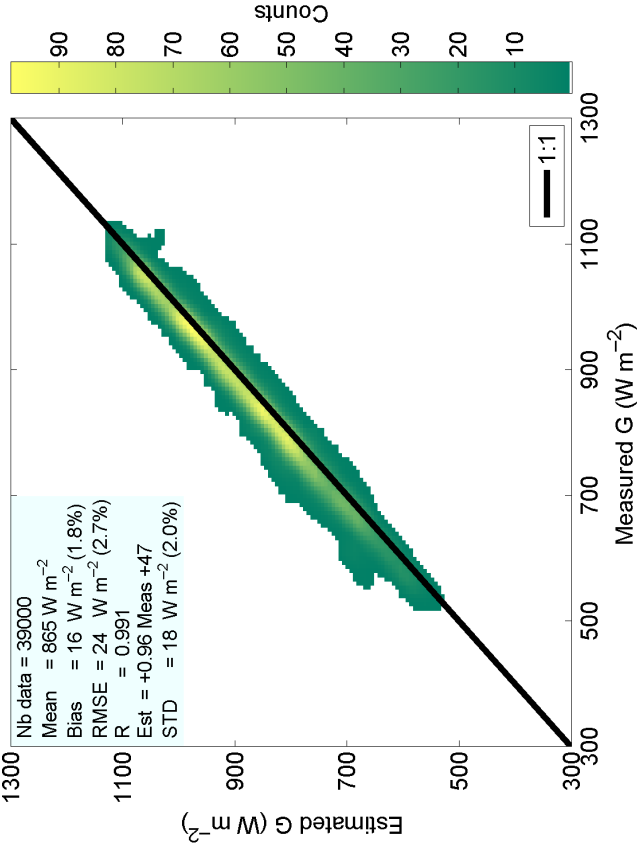
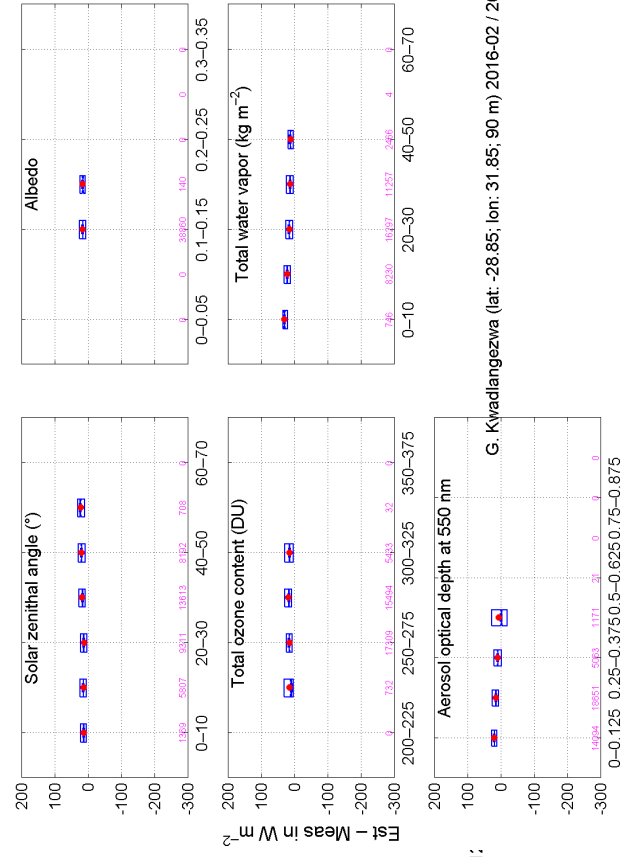


Figure S132: Comparison on direct clearness index at Alexander Bay

G. Kwadlangezwa (lat: -28.85; lon: 31.85; 90 m) 2016-02 / 2020-12



G. Kwadlangezwa (lat: -28.85; lon: 31.85; 90 m) 2016-02 / 2020-1:



G. Kwadlangezwa (lat: -28.85; lon: 31.85; 90 m) 2016-02 / 2020-12

Figure S133: Comparison on global irradiance at Kwadlangezwa

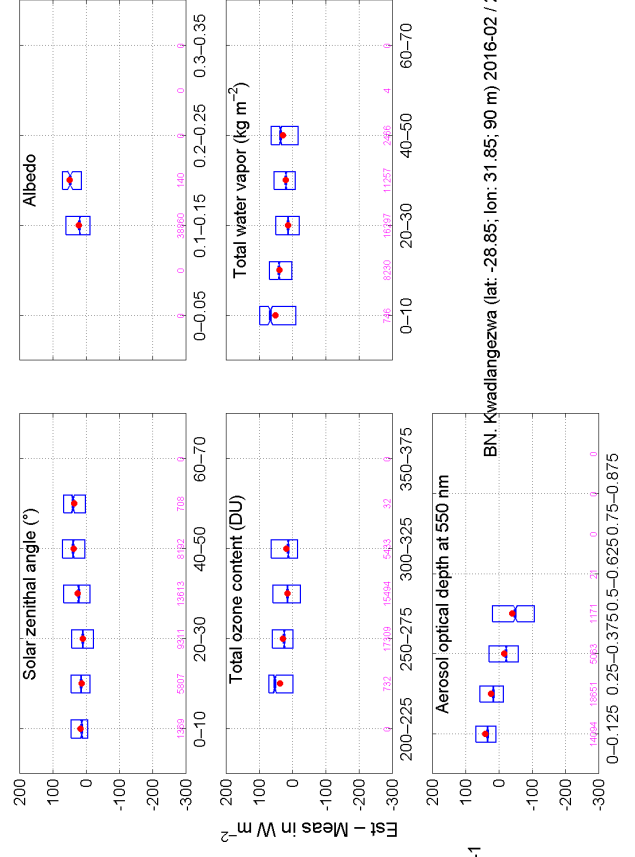
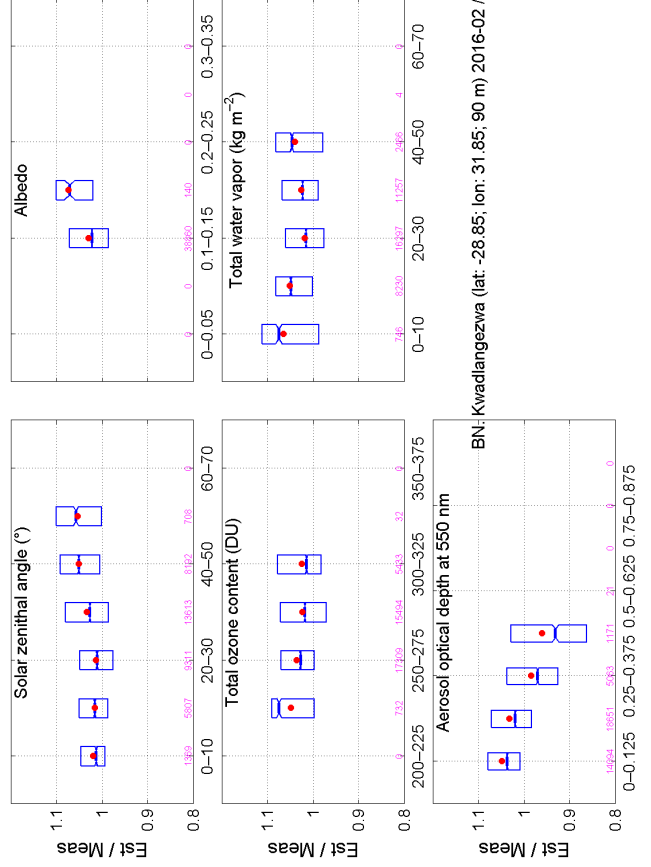
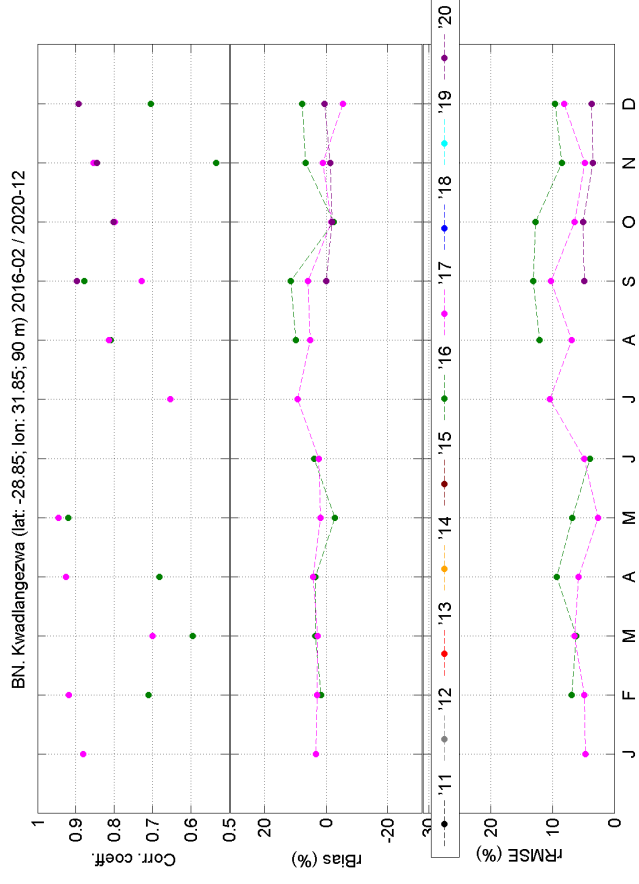
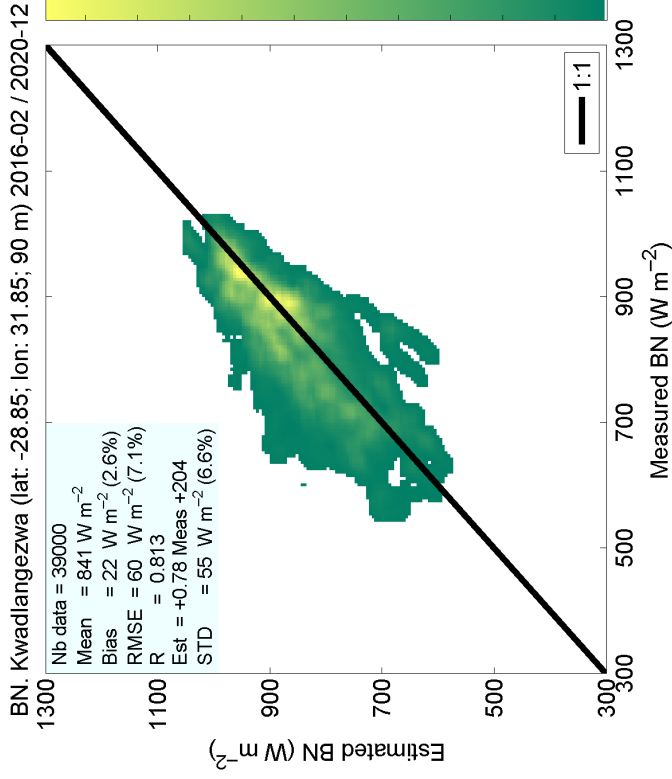


Figure S134: Comparison on direct component at normal irradiance at Kwadlangezwa

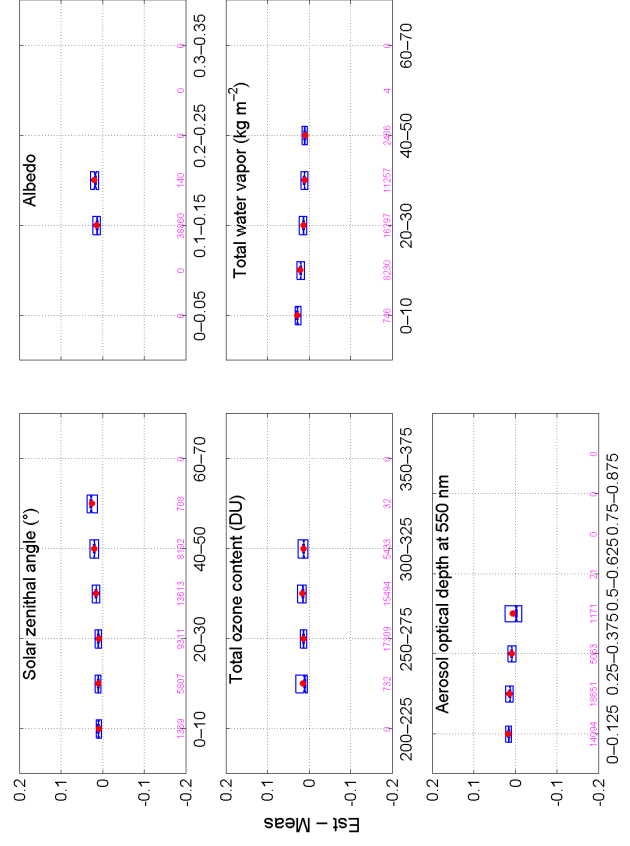
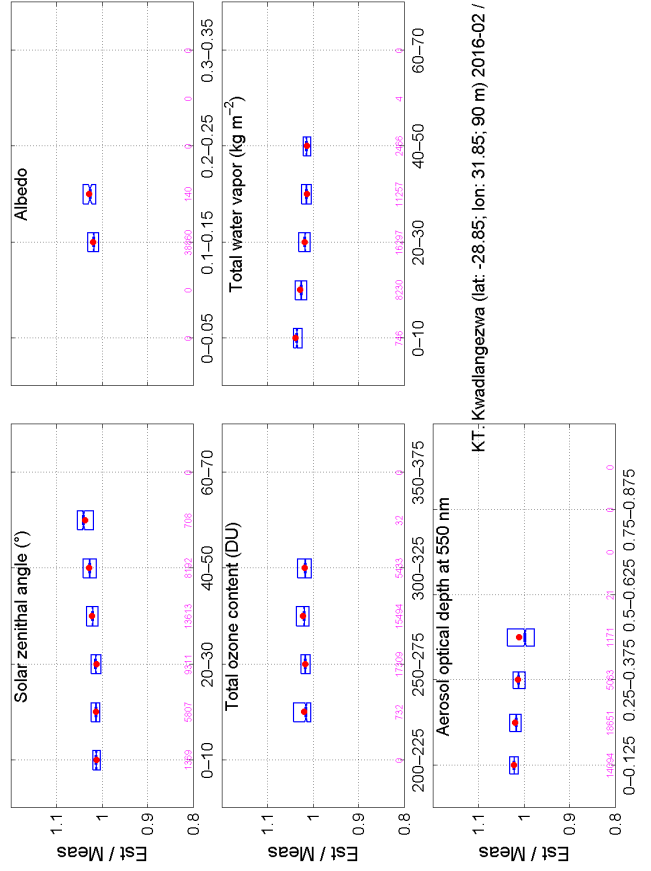
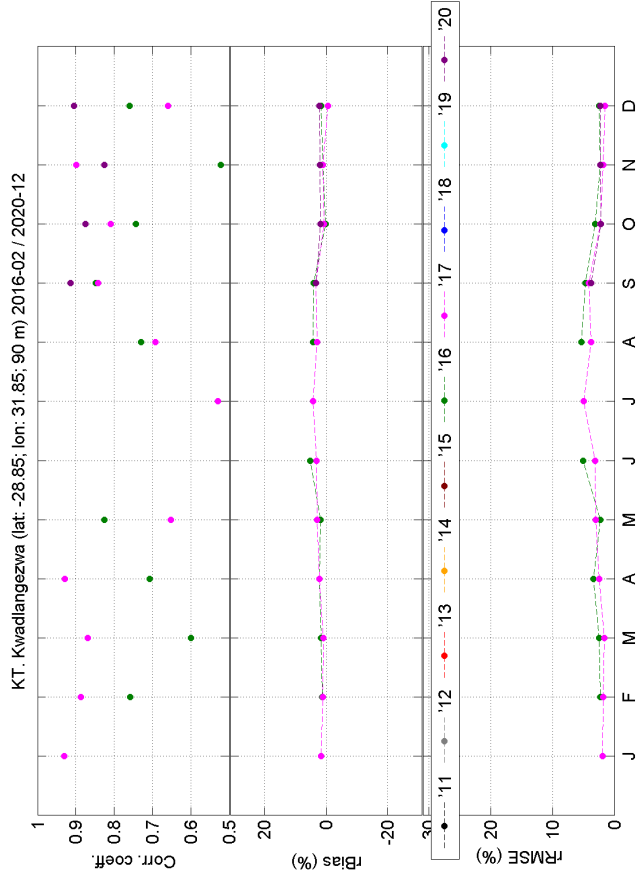
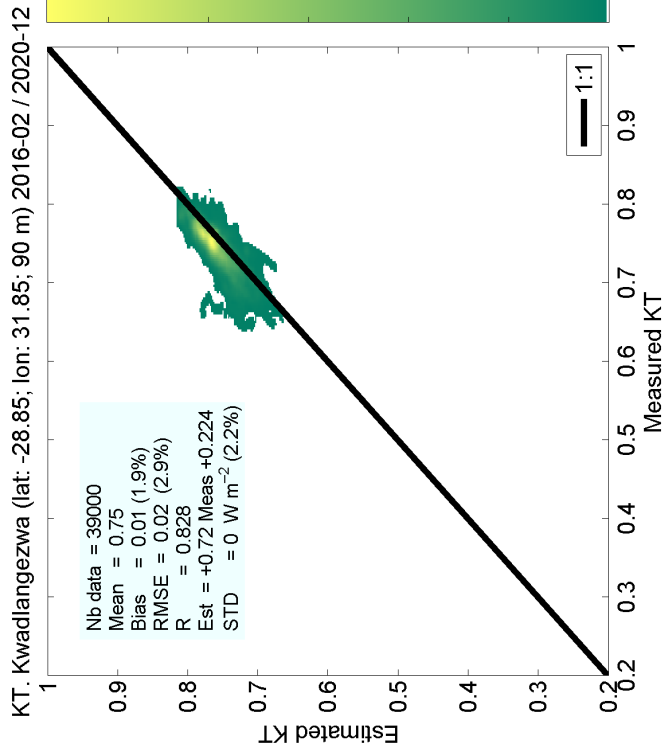


Figure S135: Comparison on clearness index at Kwadlangezwa

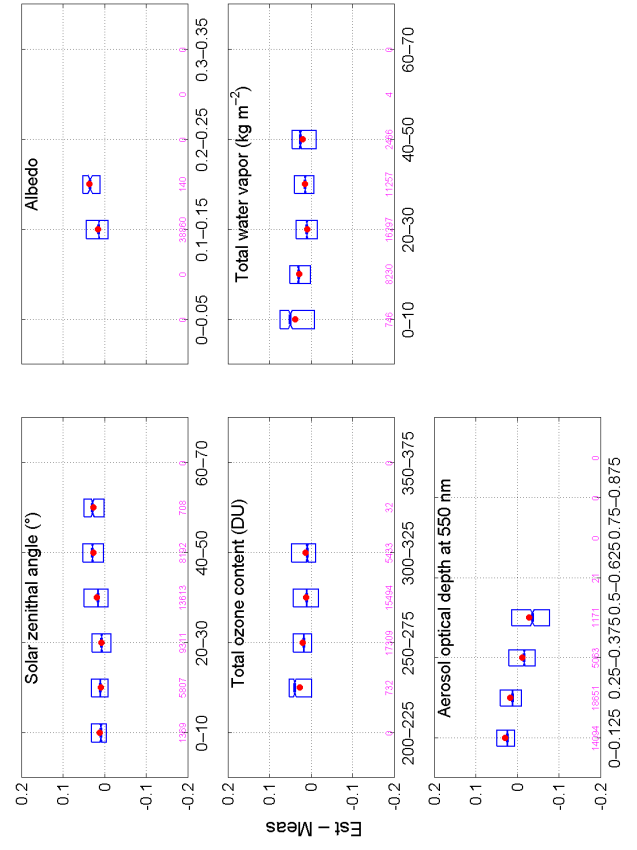
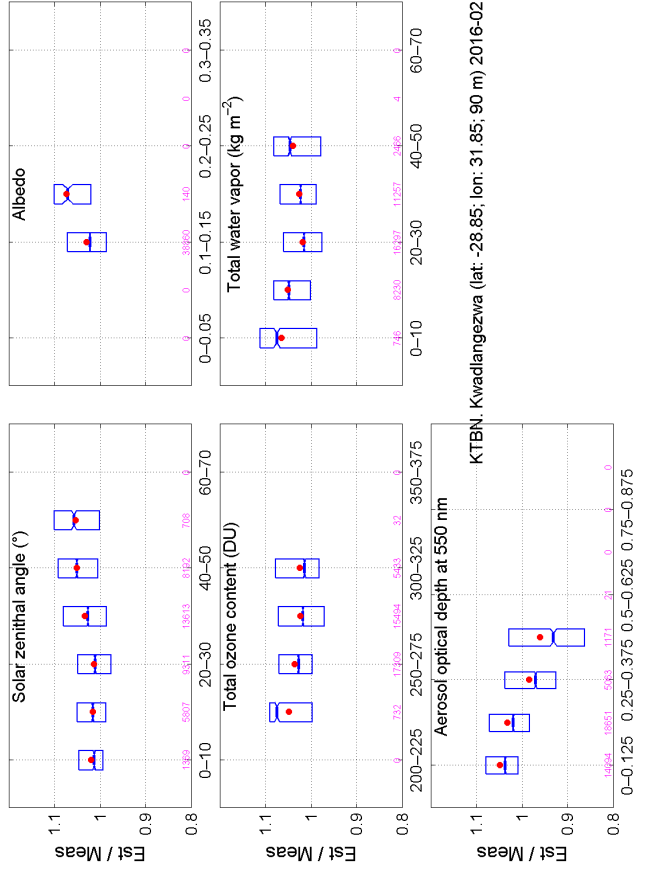
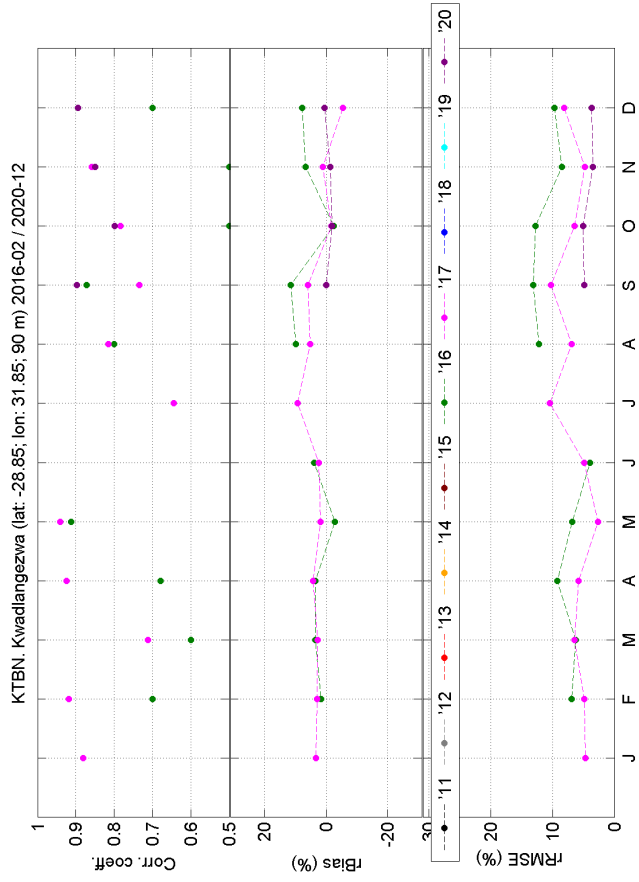
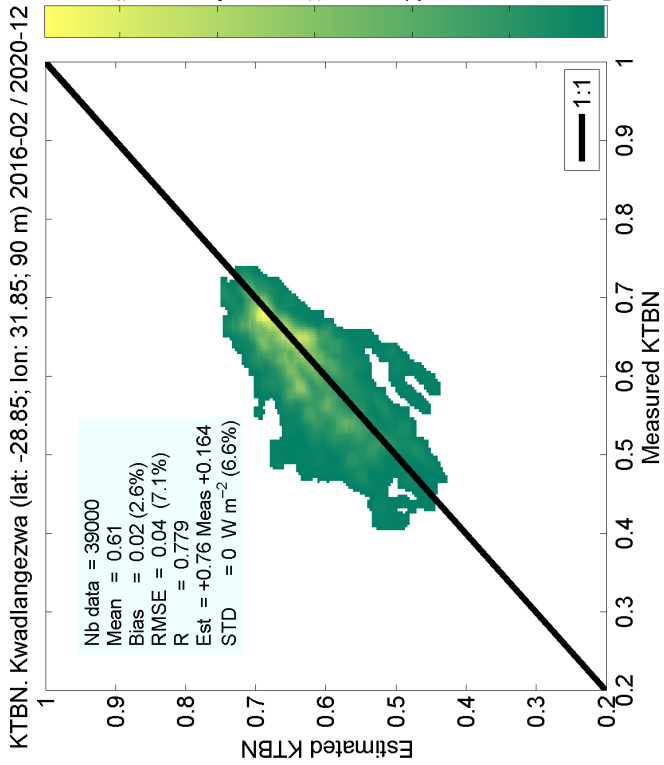


Figure S136: Comparison on direct clearness index at Kwadlangezwa

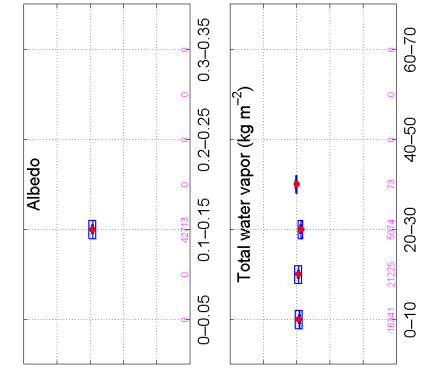
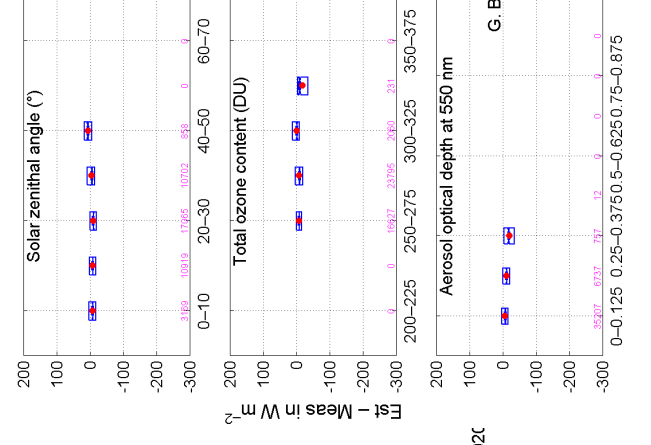
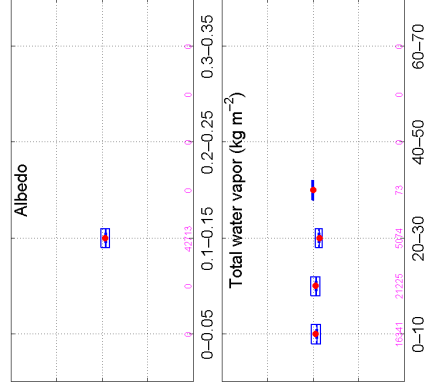
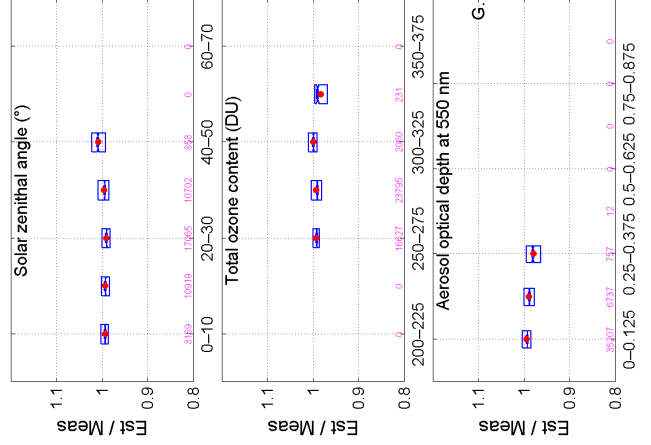
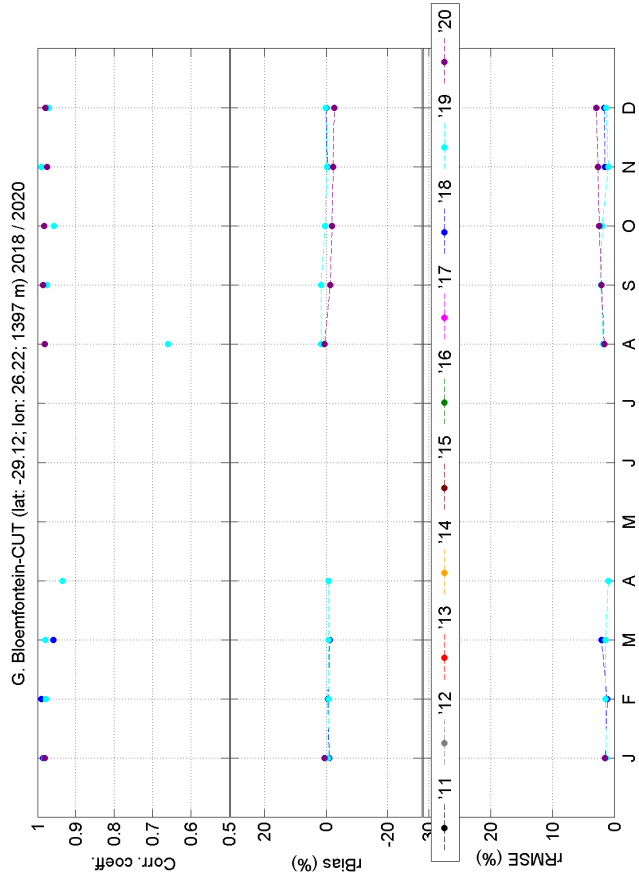
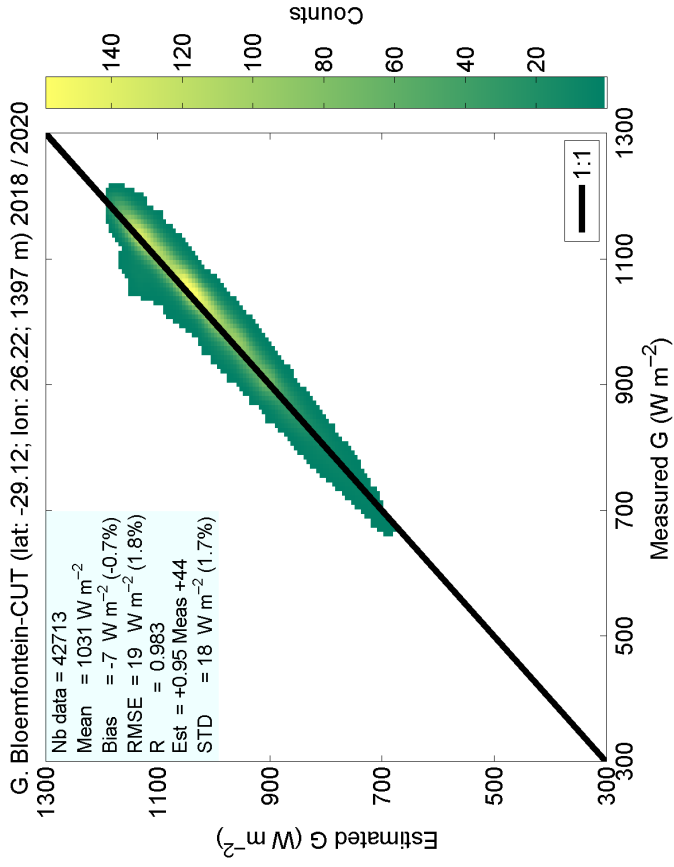


Figure S137: Comparison on global irradiance at Bloemfontein-CUT

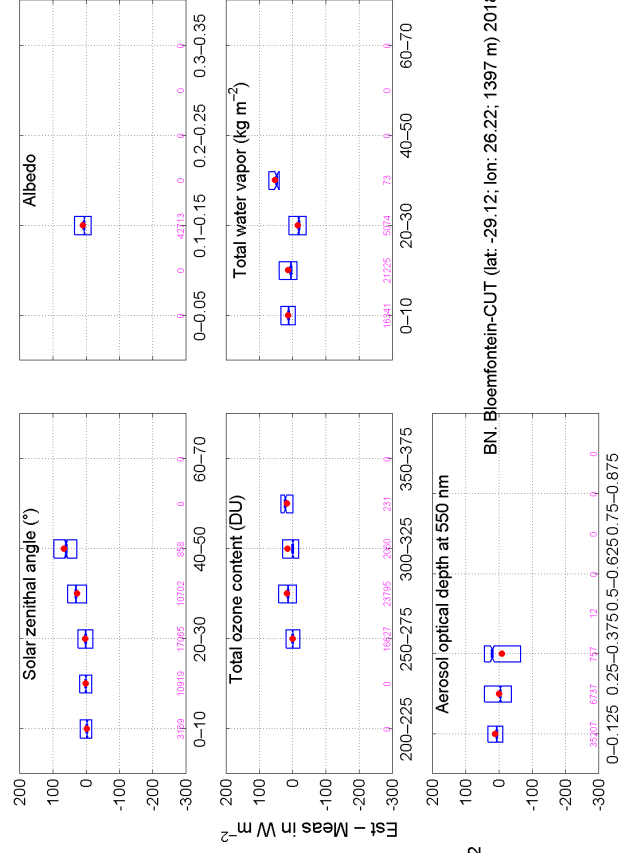
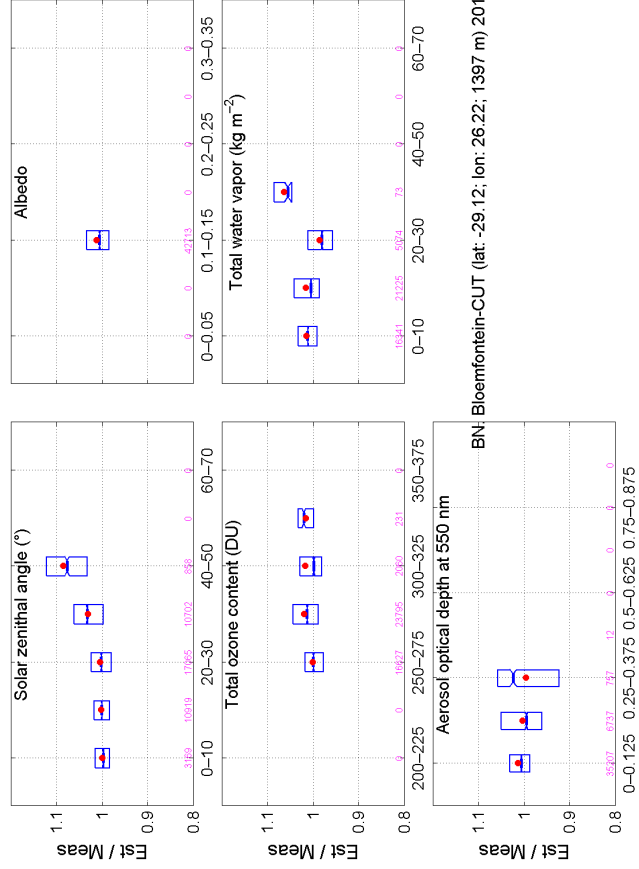
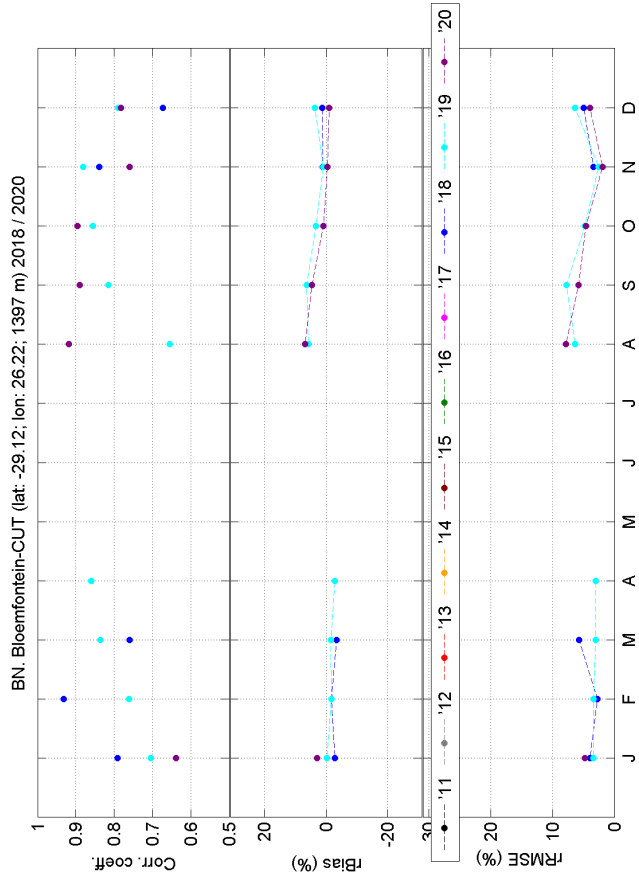
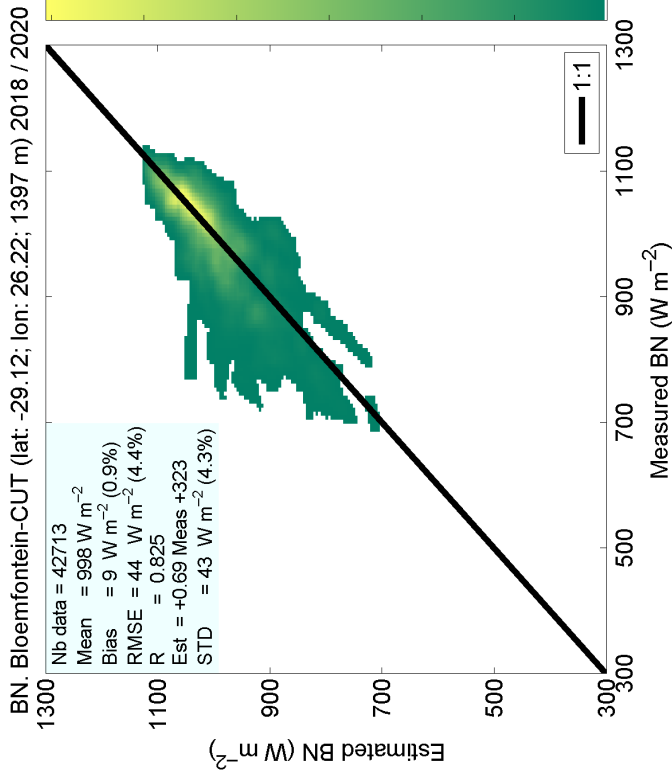


Figure S138: Comparison on direct component at Bloemfontein-CUT

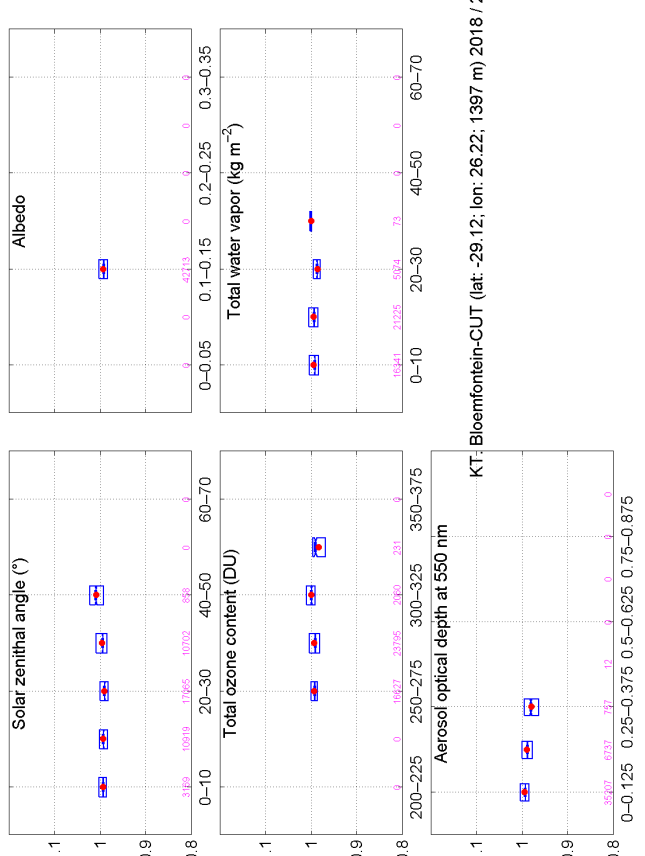
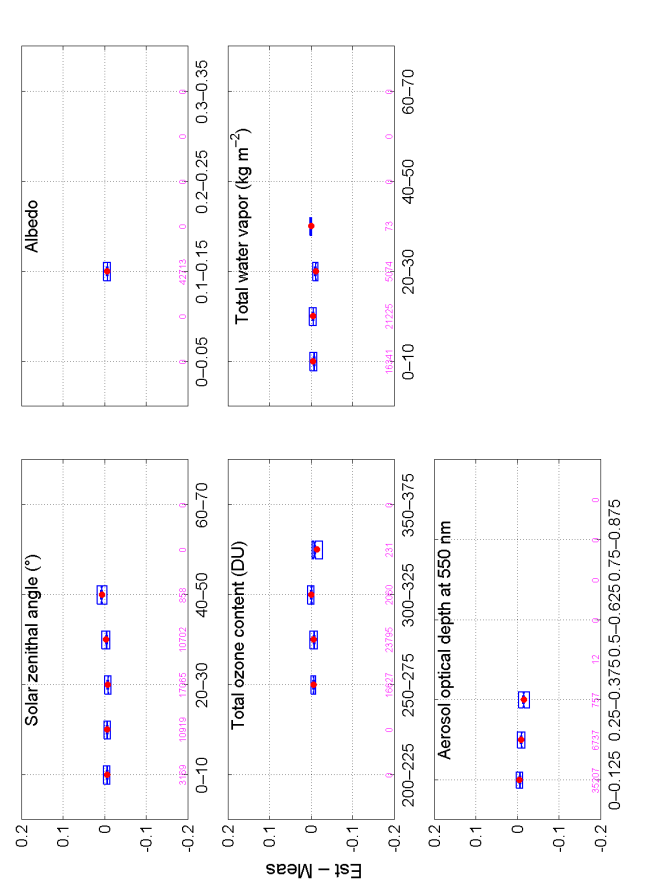
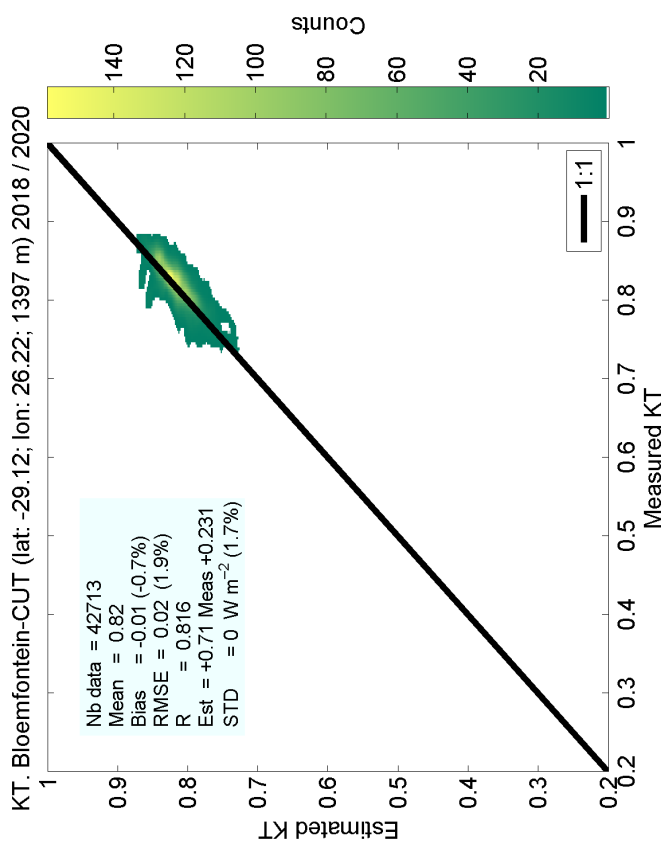
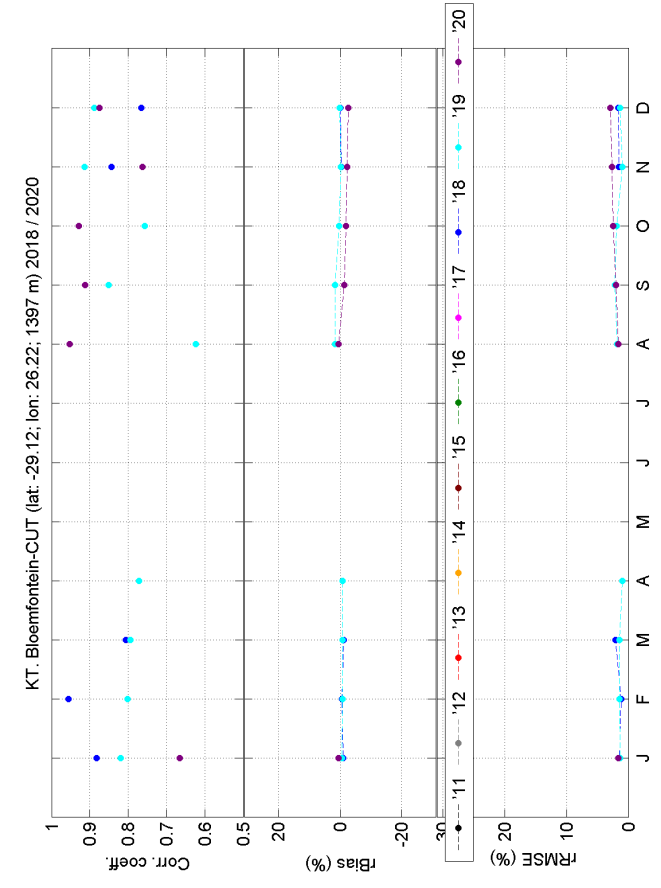


Figure S139: Comparison on clearness index at Bloemfontein-CUT

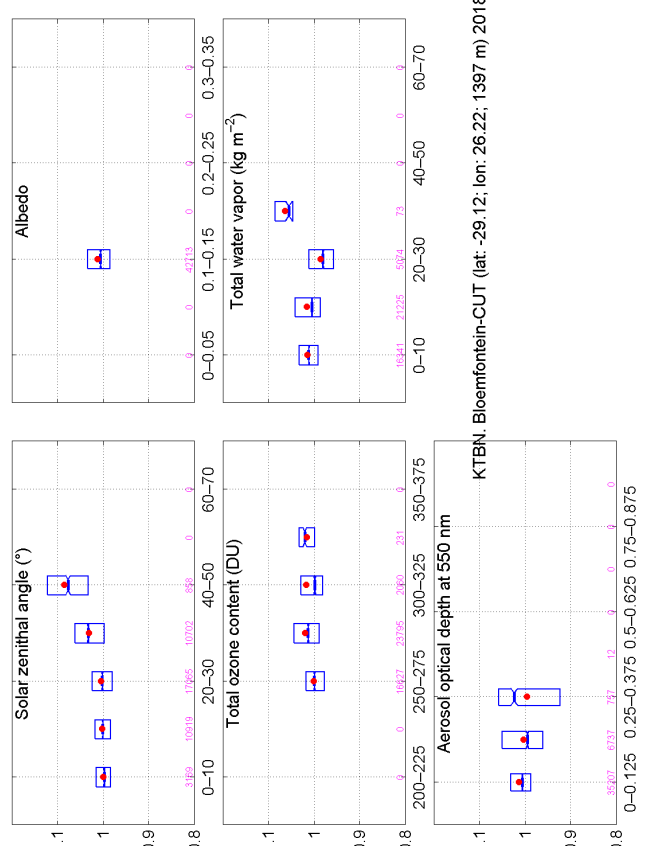
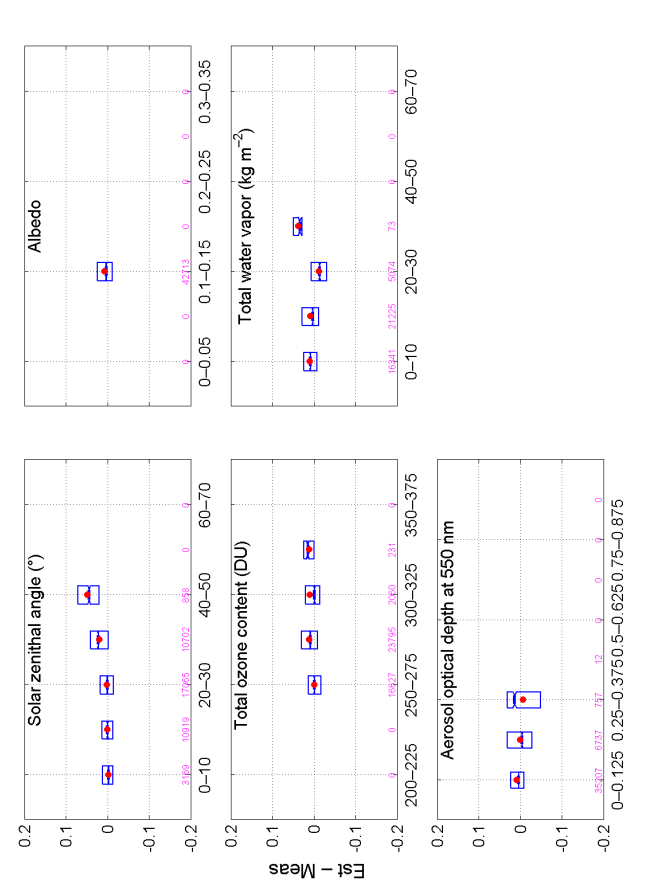
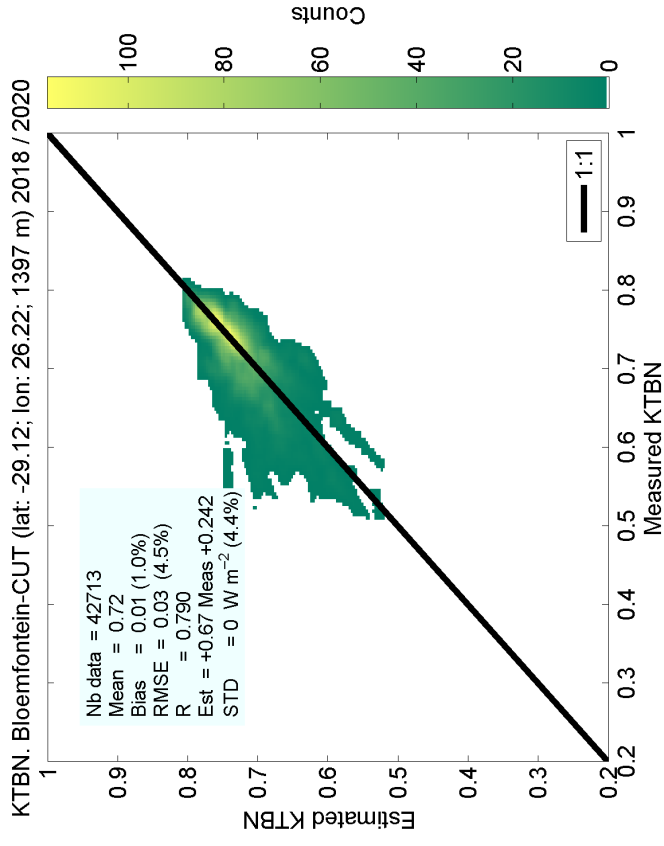
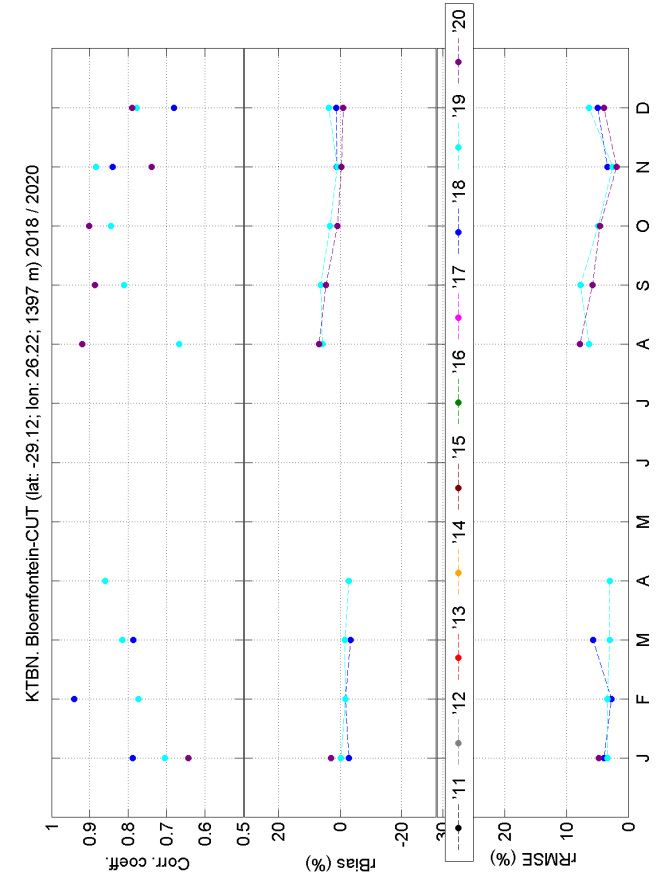


Figure S140: Comparison on direct clearness index at Bloemfontein-CUT

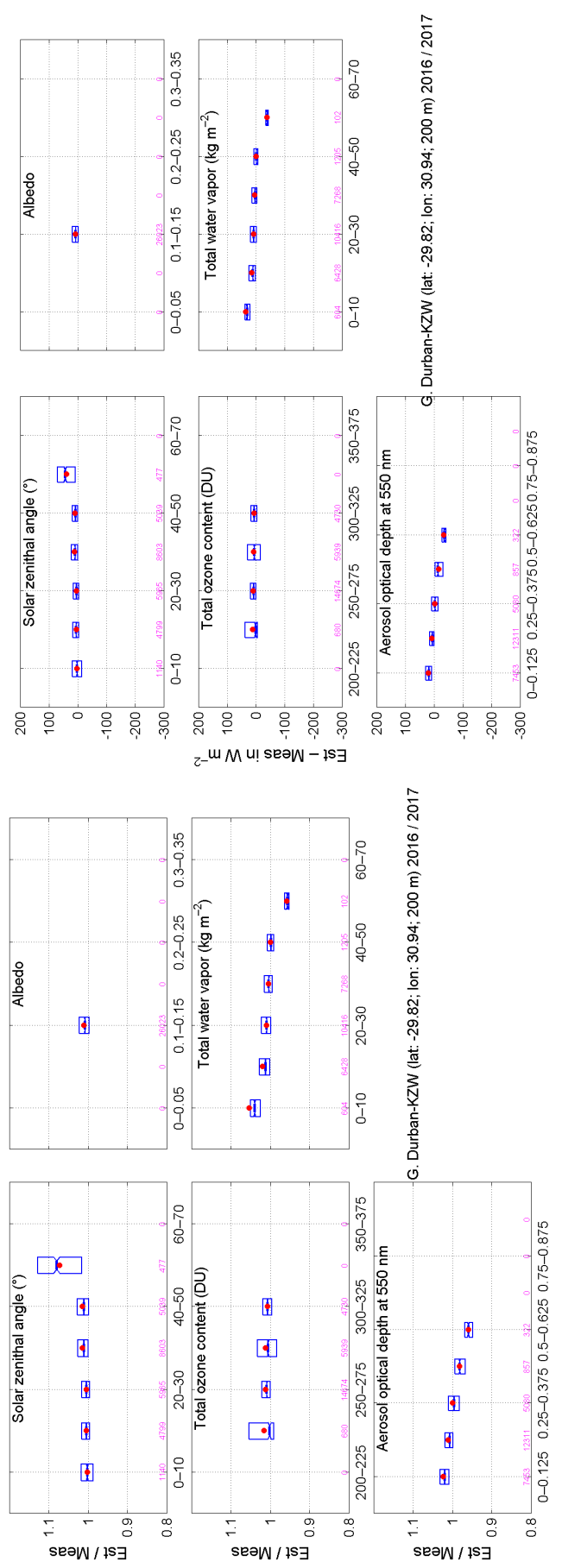
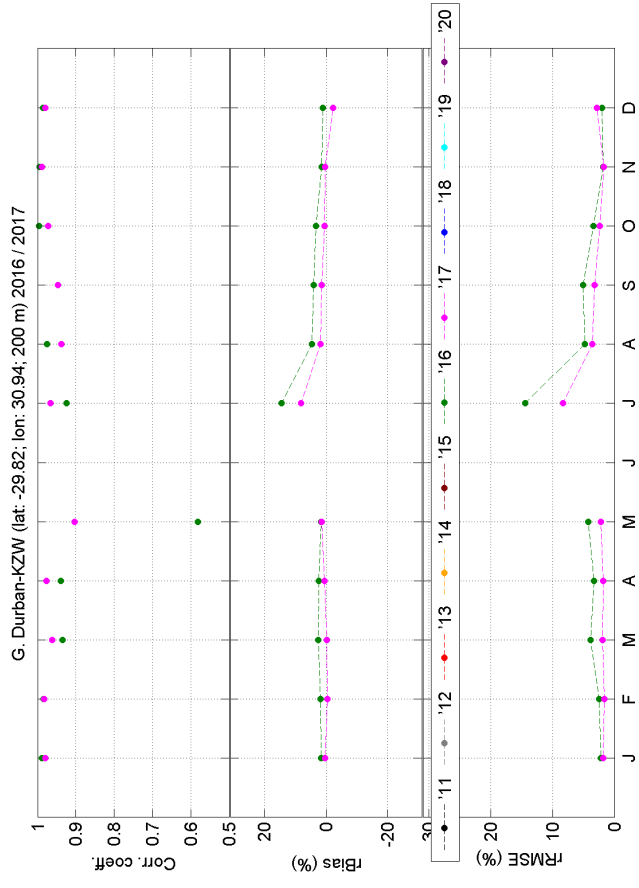
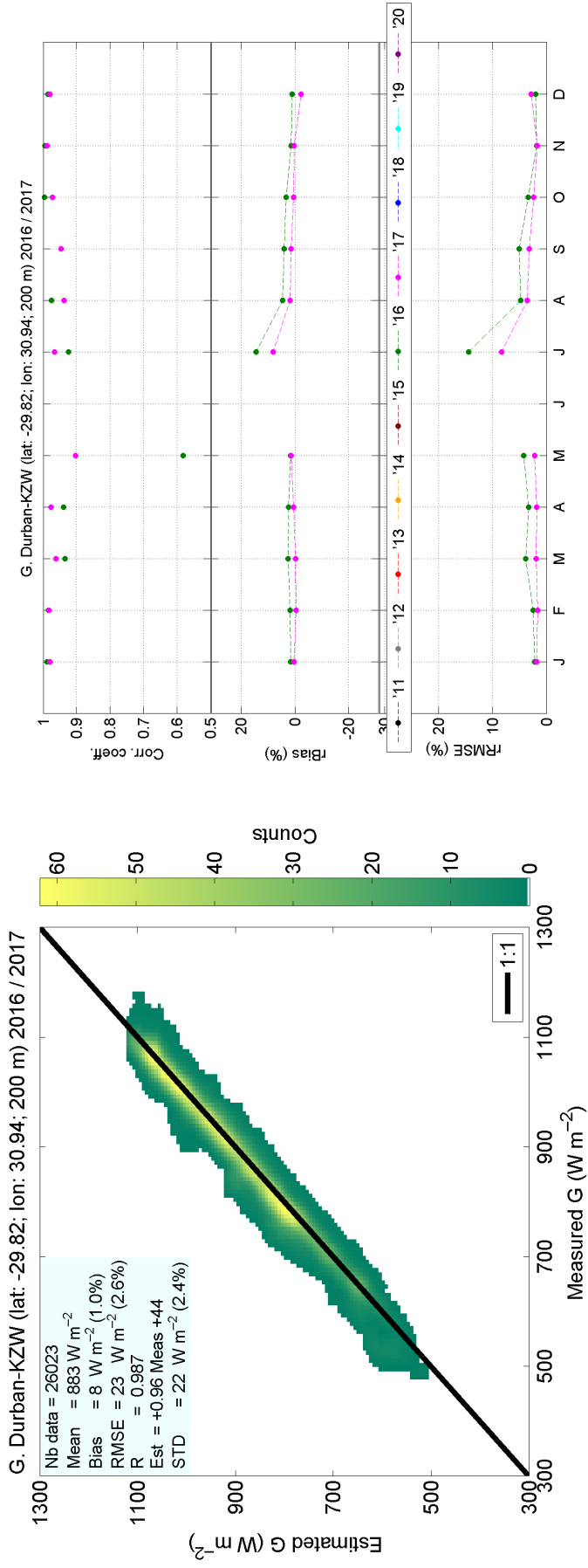


Figure S141: Comparison on global irradiance at Durban-KZW

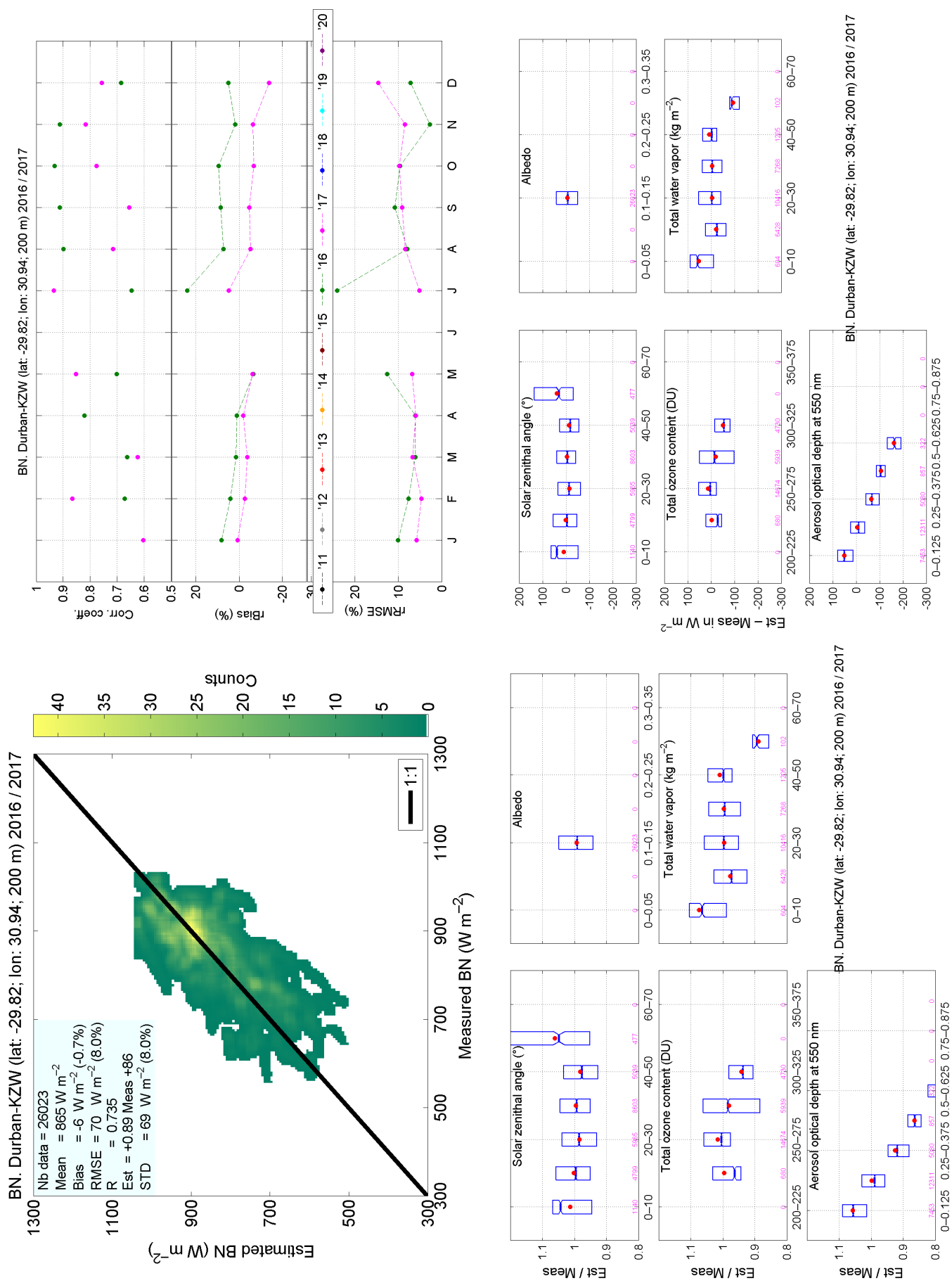
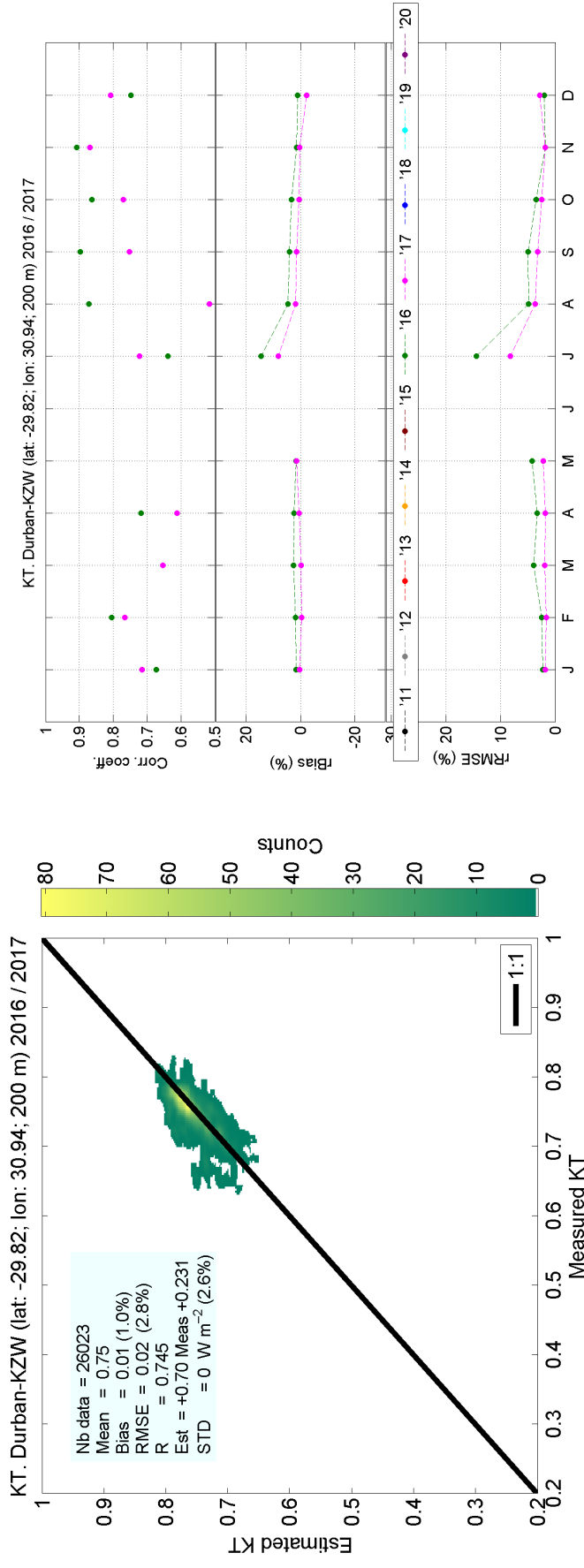


Figure S142: Comparison on direct component at normal irradiance at Durban-KZW



KT. Durban-KZW (lat: -29.82; lon: 30.94; 200 m) 2016 / 2017

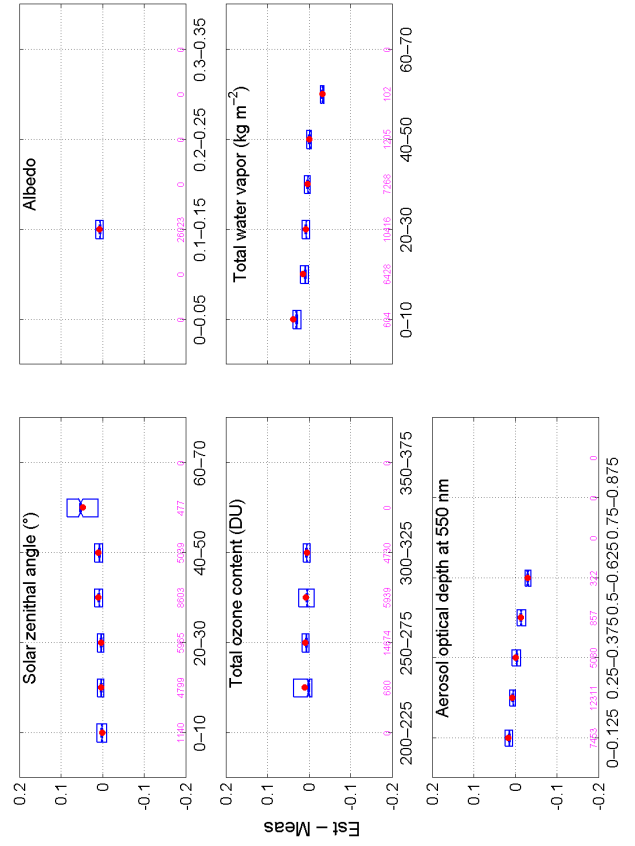
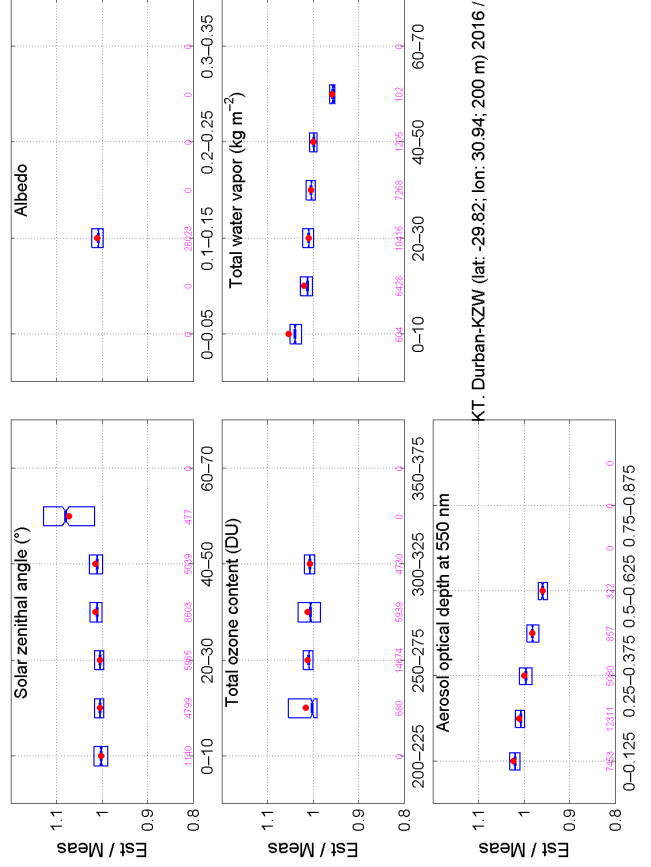
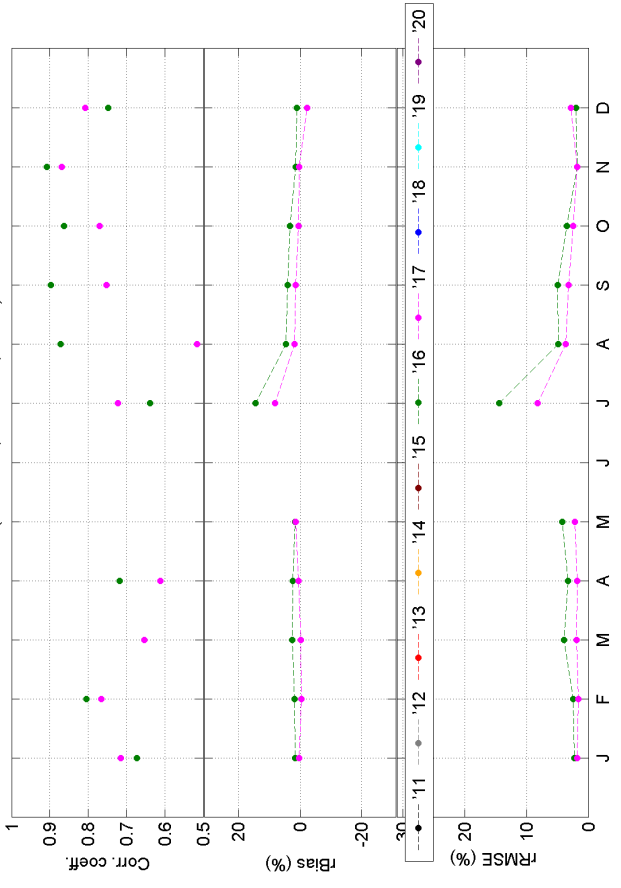


Figure S143: Comparison on clearness index at Durban-KZW

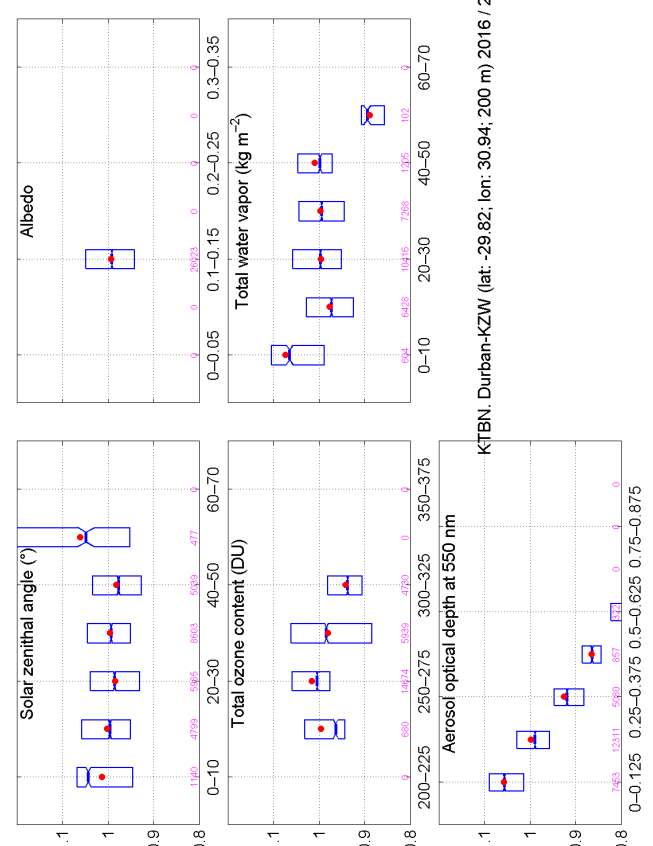
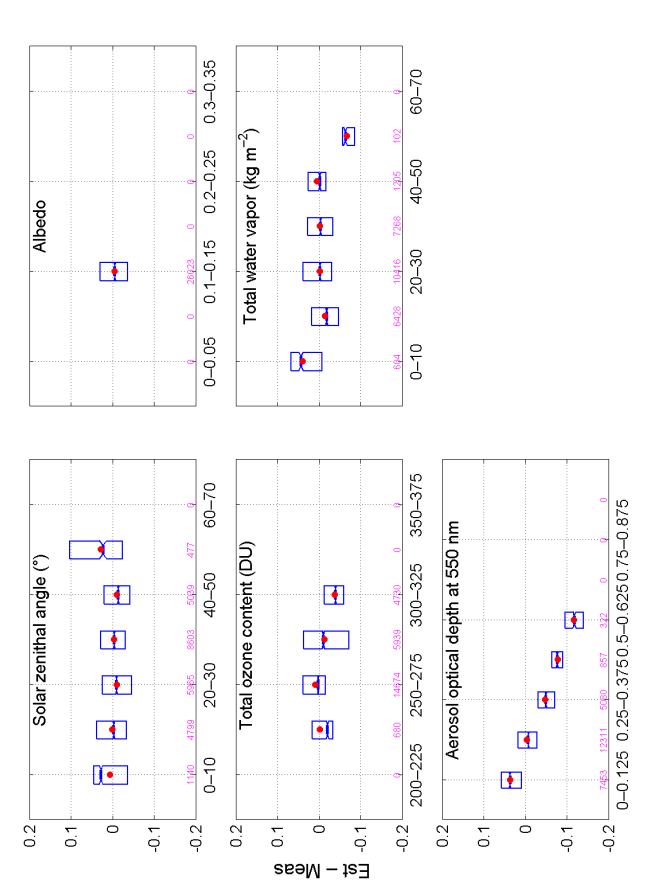
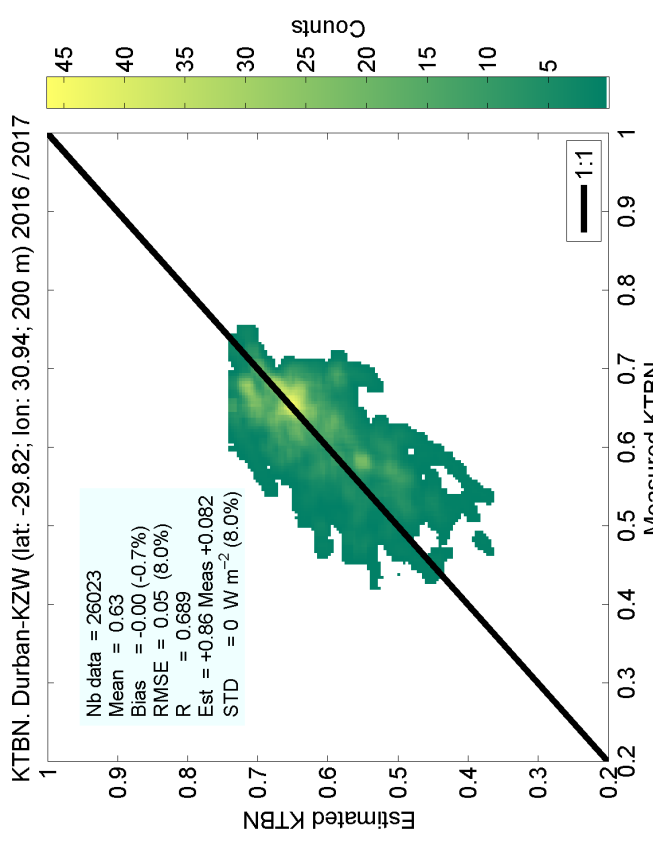
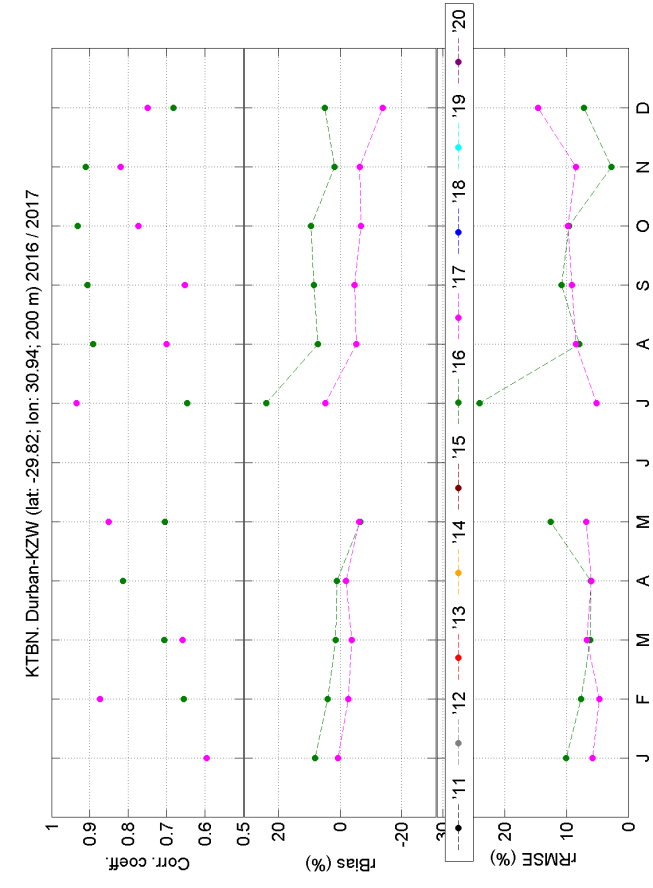


Figure S144: Comparison on direct clearness index at Durban-KZW

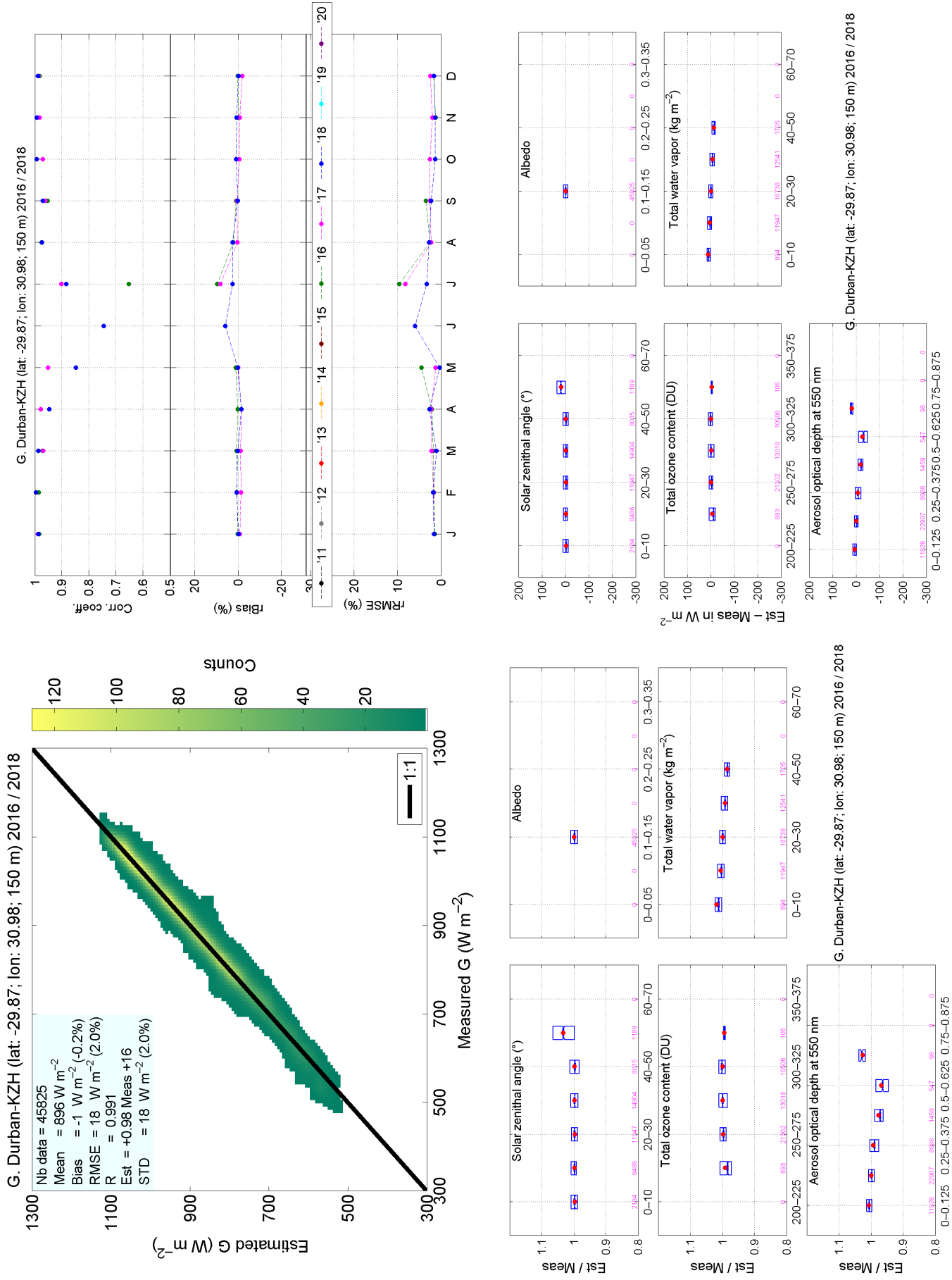


Figure S145: Comparison on global irradiance at Durban-KZH

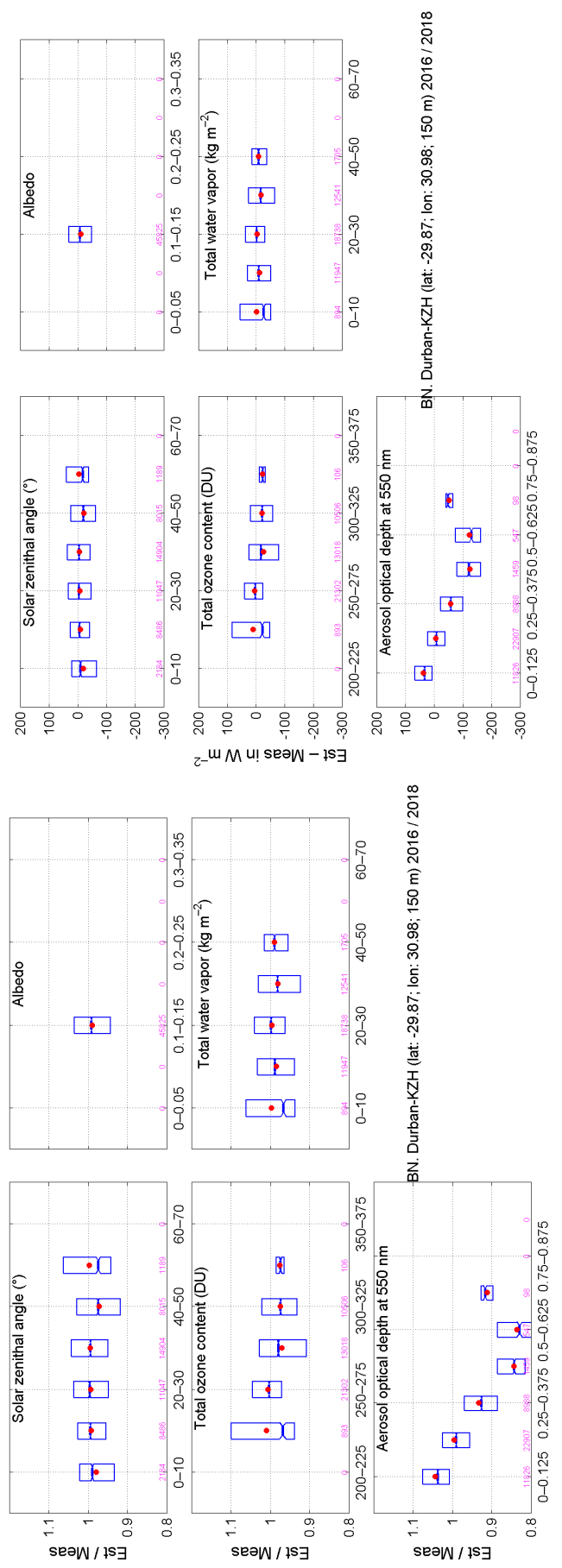
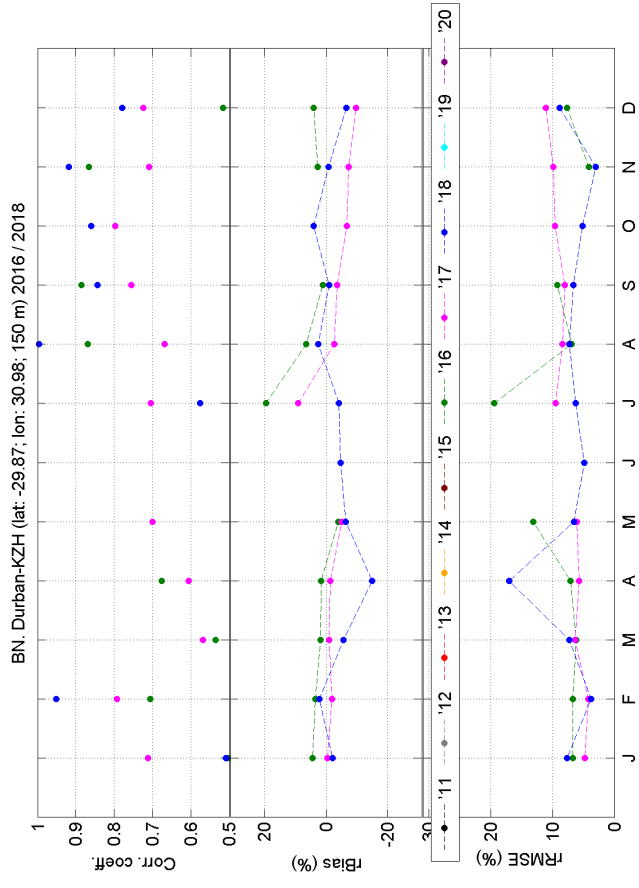
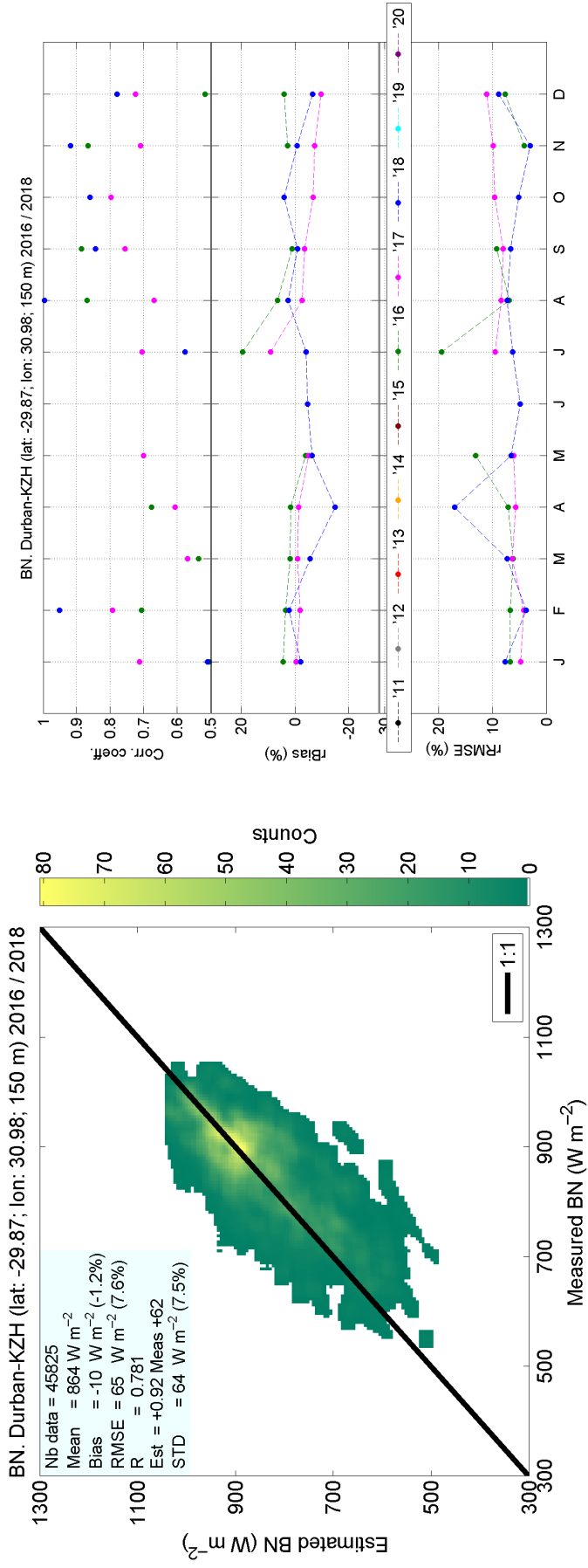


Figure S146: Comparison on direct component at normal irradiance at Durban-KZH

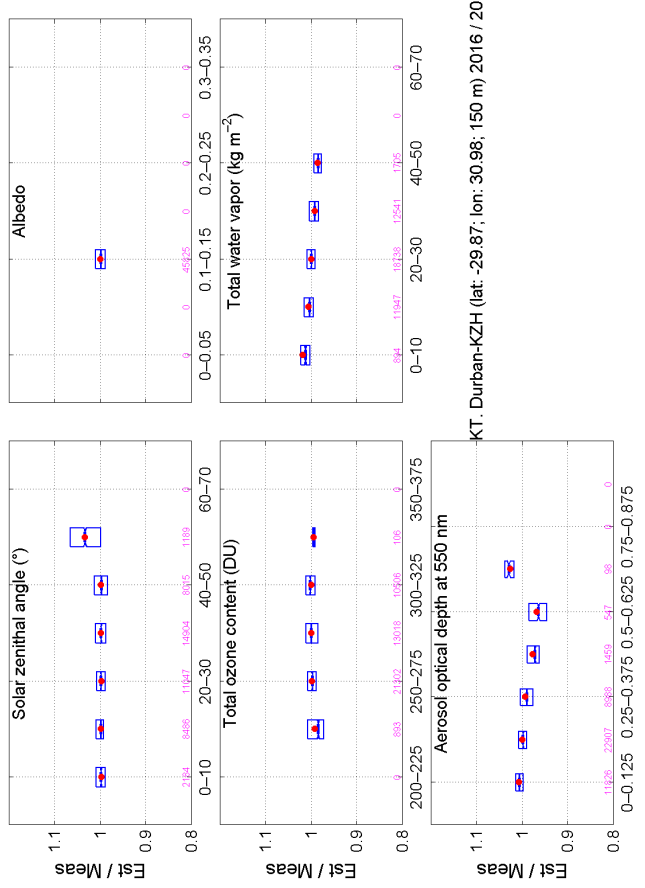
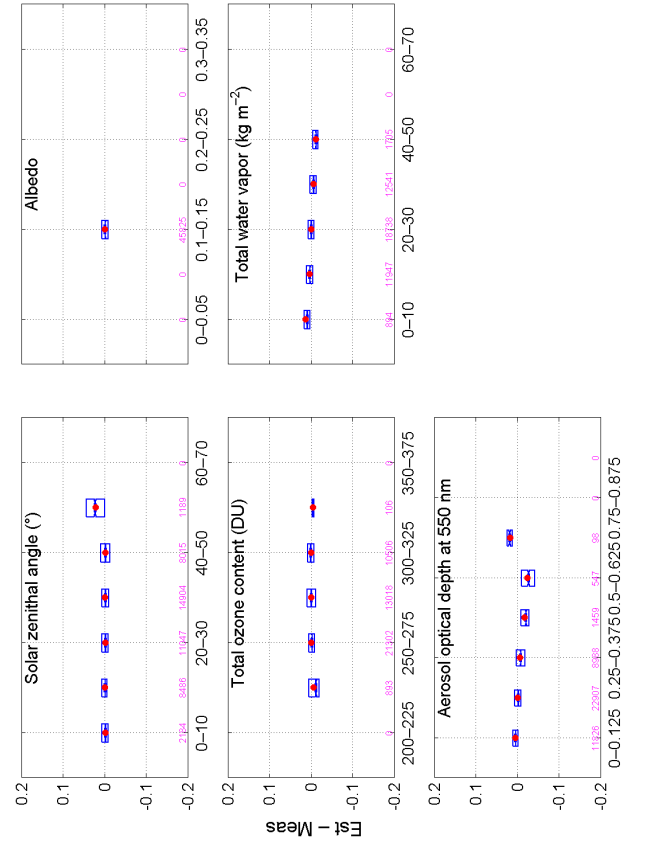
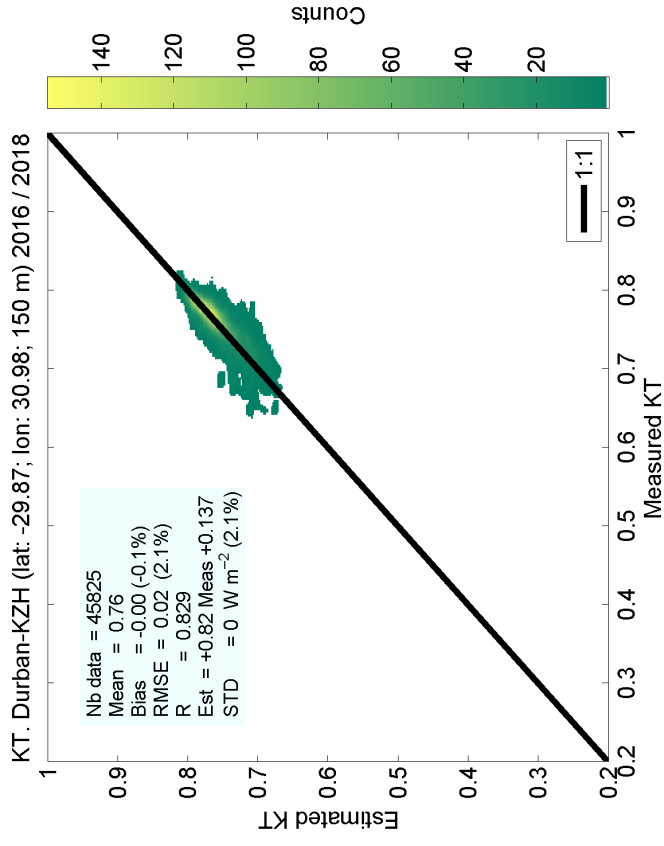
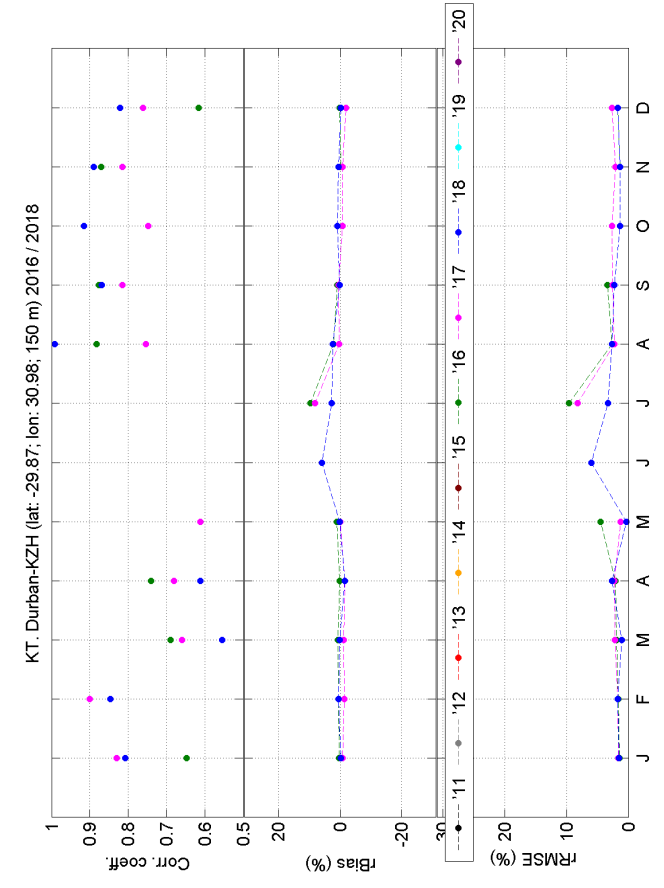


Figure S147: Comparison on clearness index at Durban-KZH

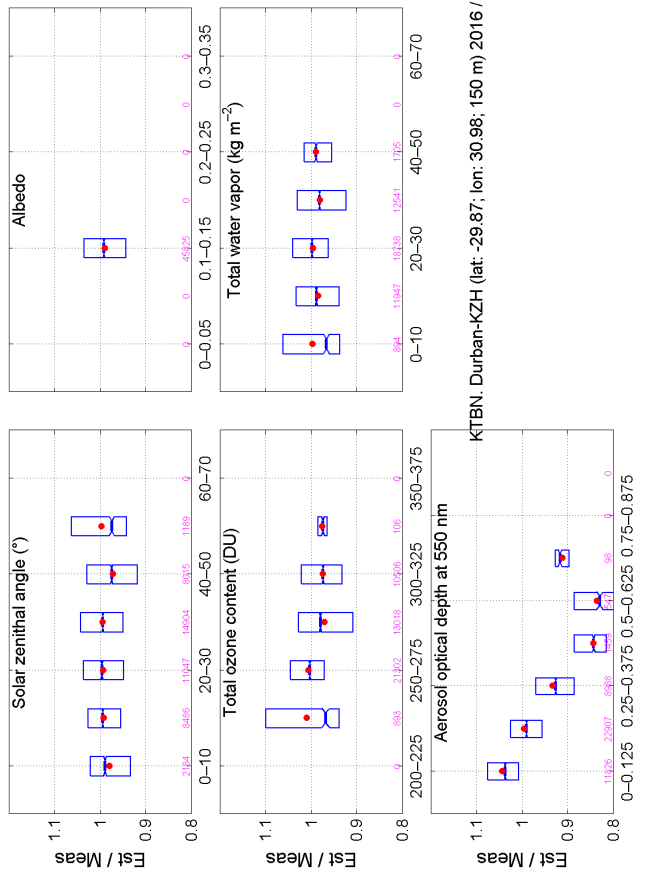
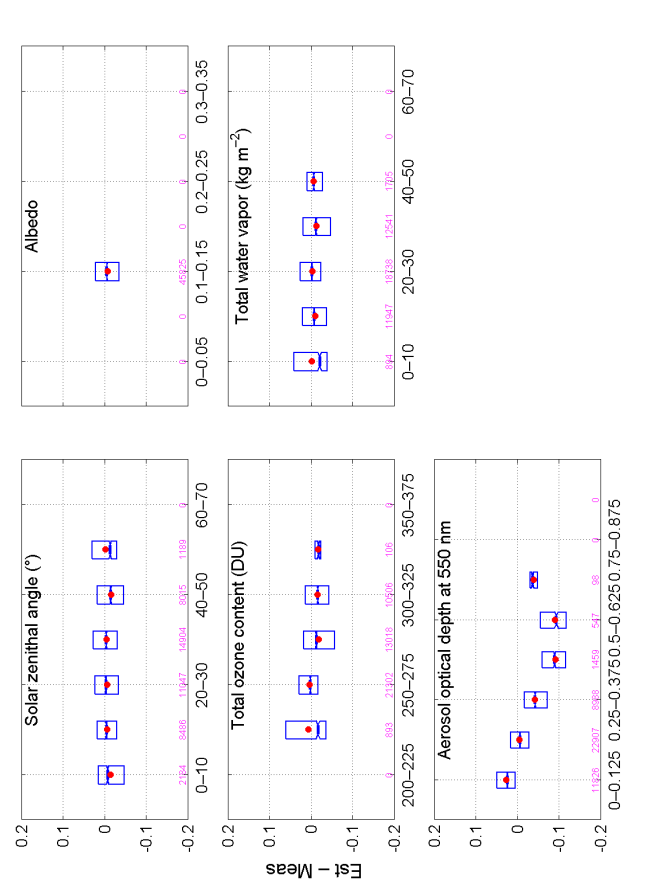
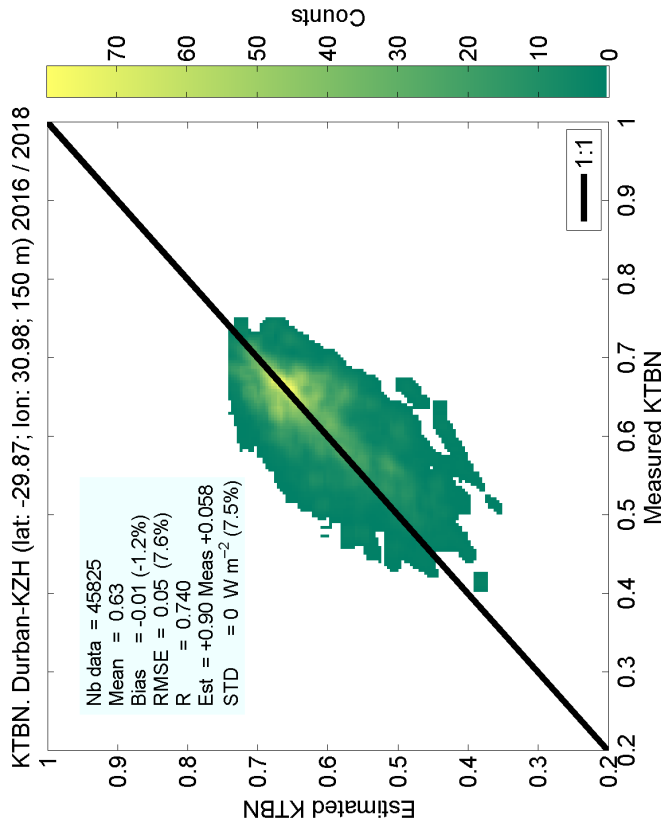
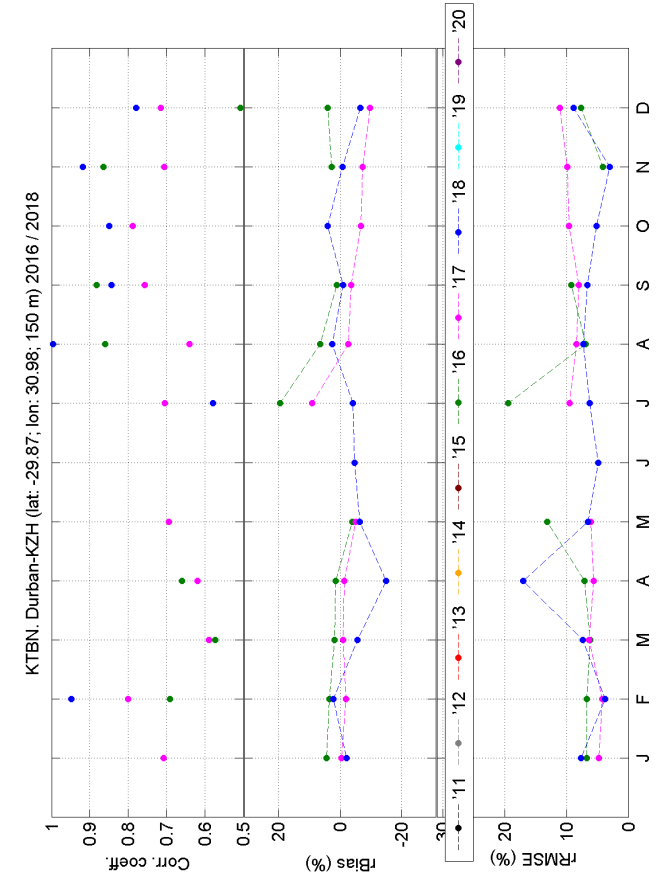


Figure S148: Comparison on direct clearness index at Durban-KZH

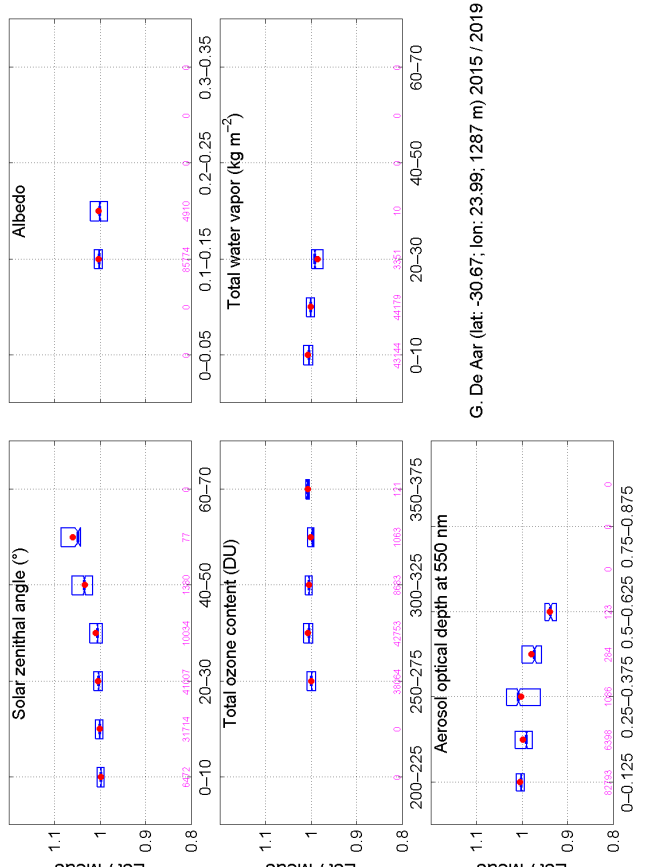
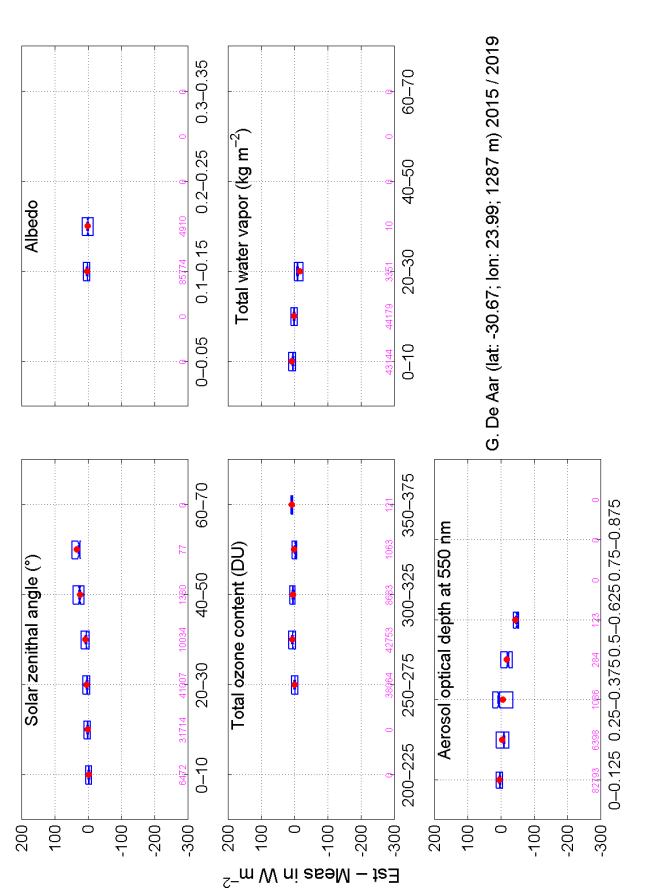
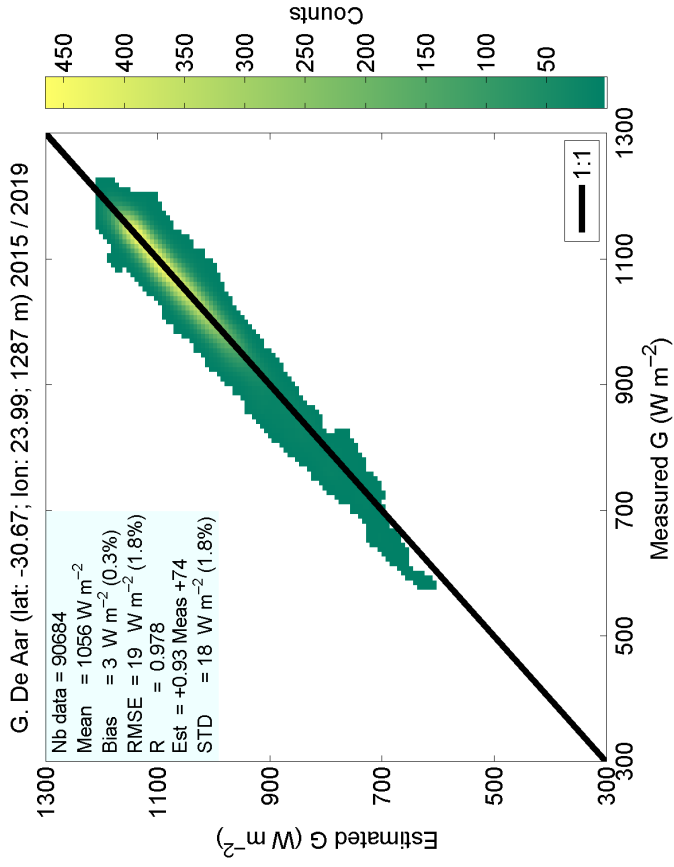
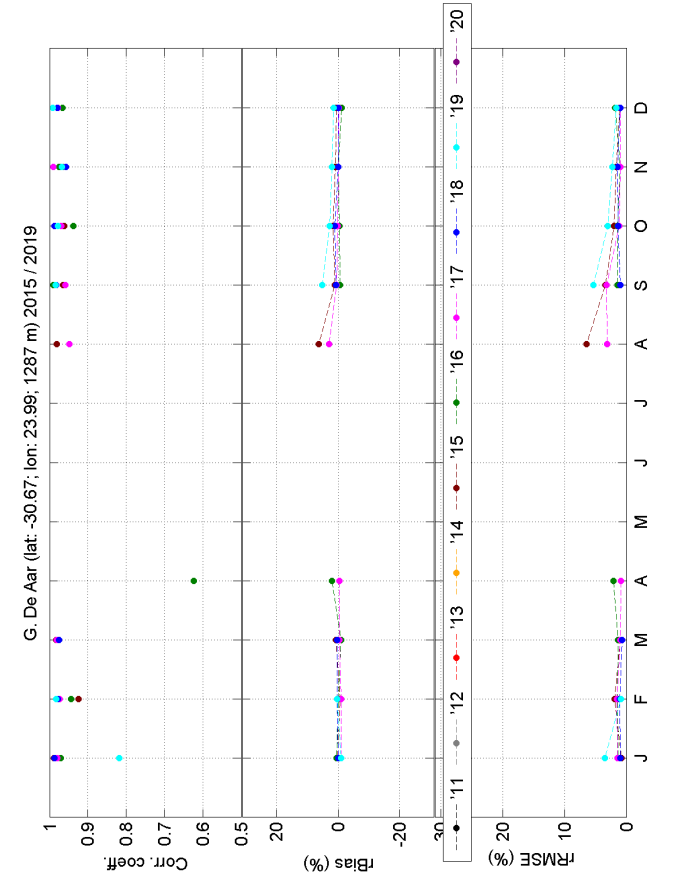


Figure S149: Comparison on global irradiance at De Aar

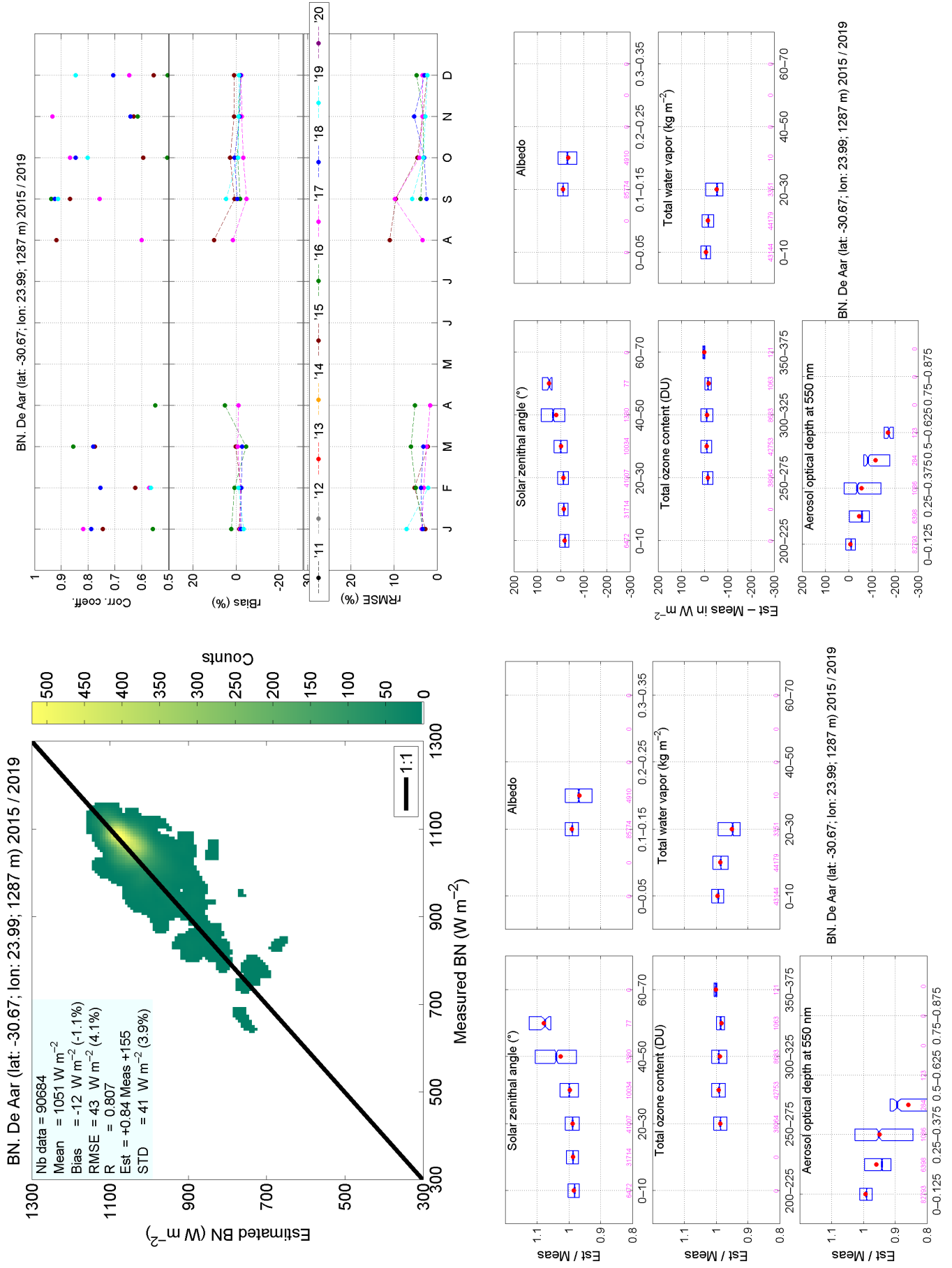


Figure S150: Comparison on direct component at normal irradiance at De Aar

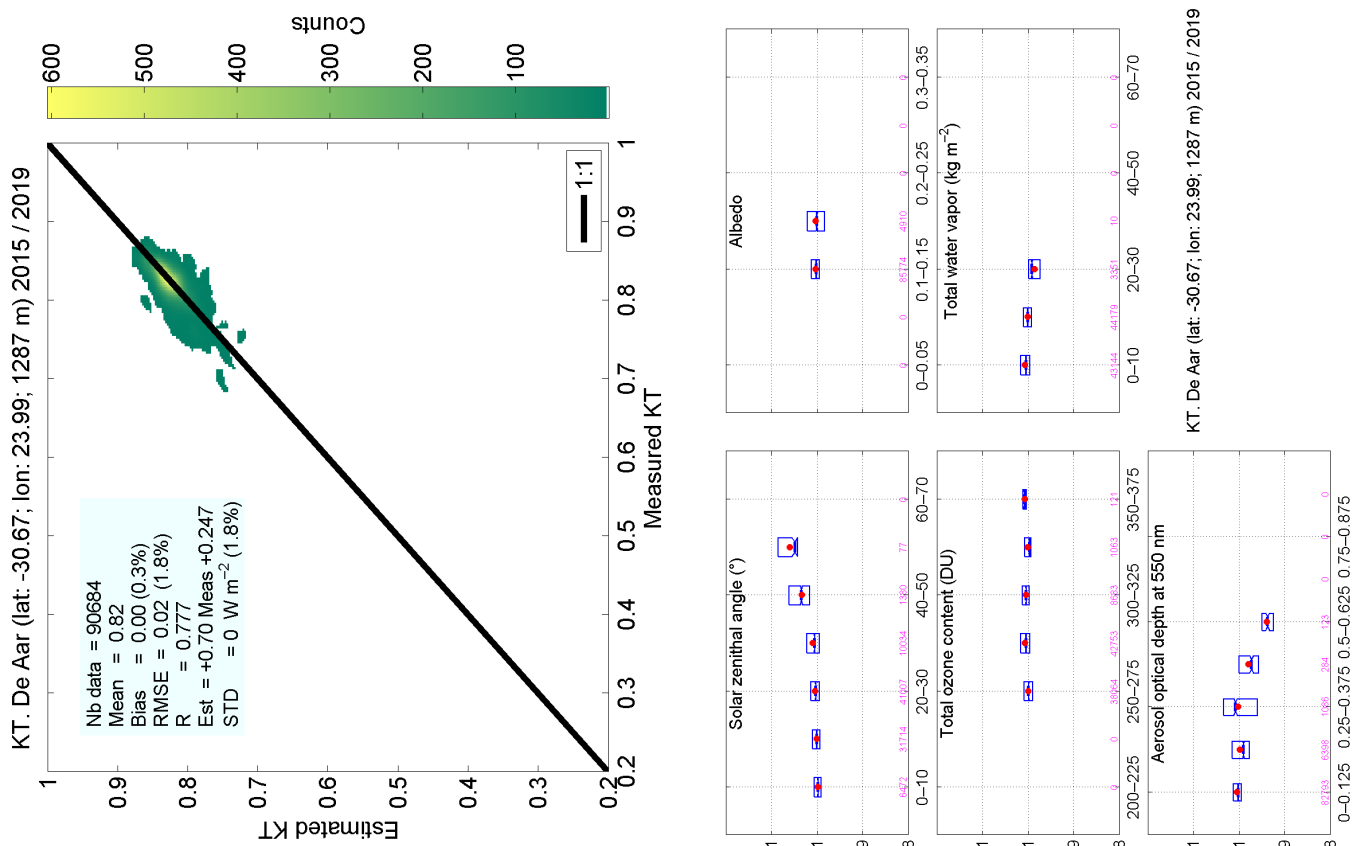
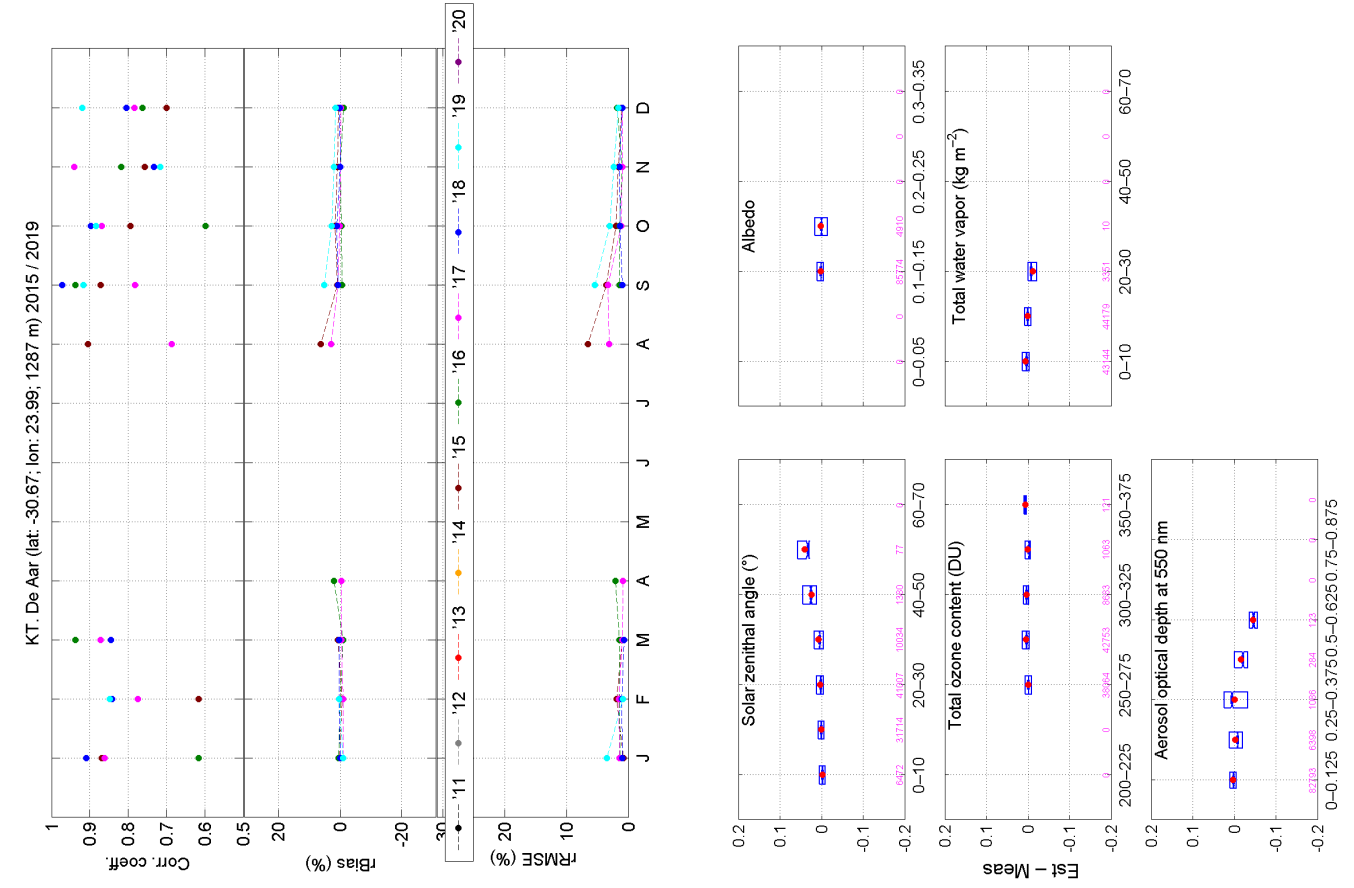


Figure S151: Comparison on clearness index at De Aar

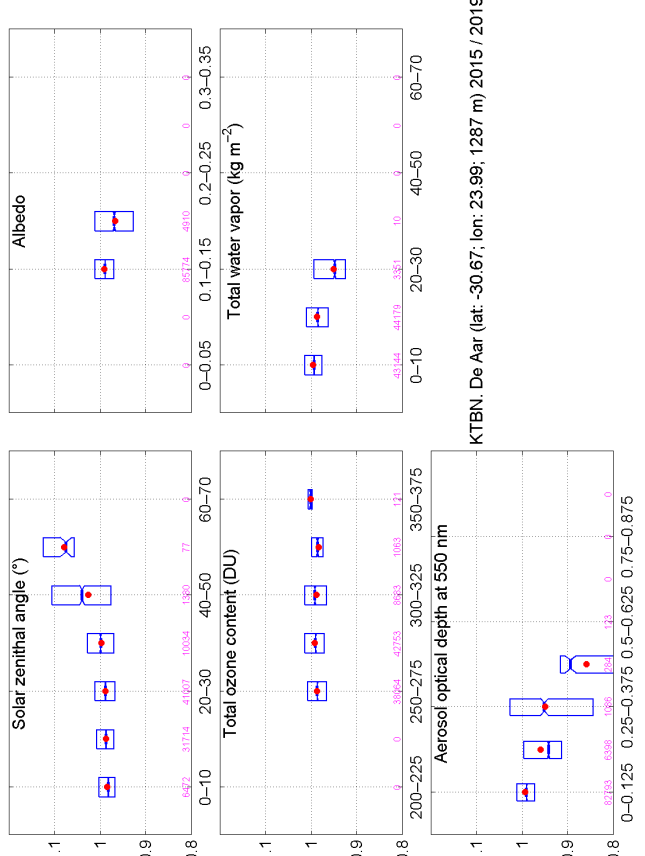
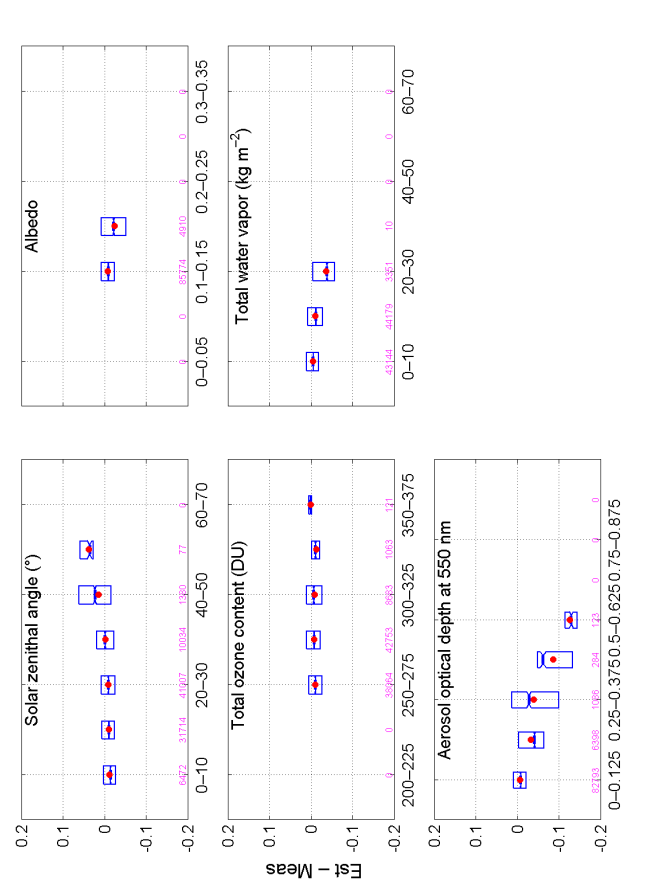
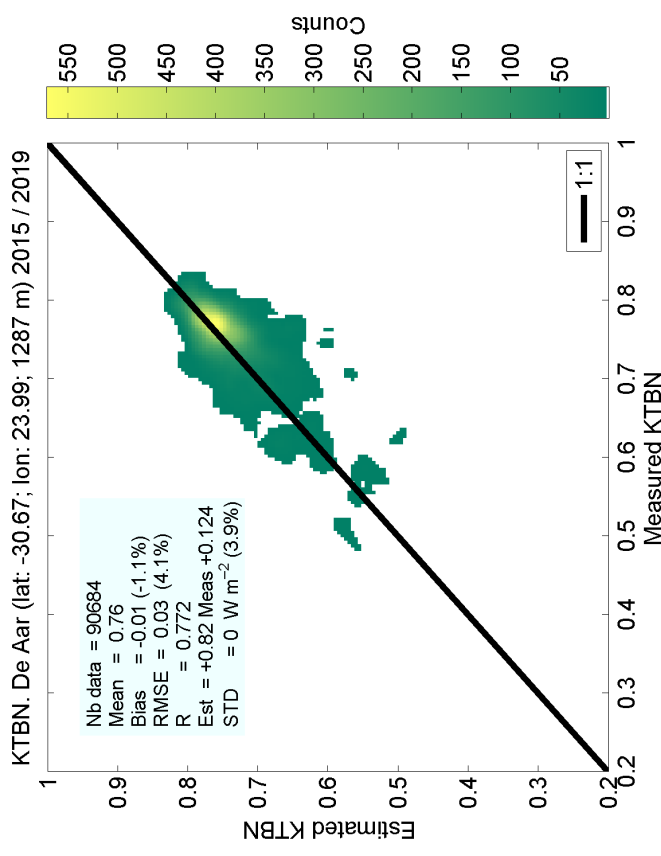
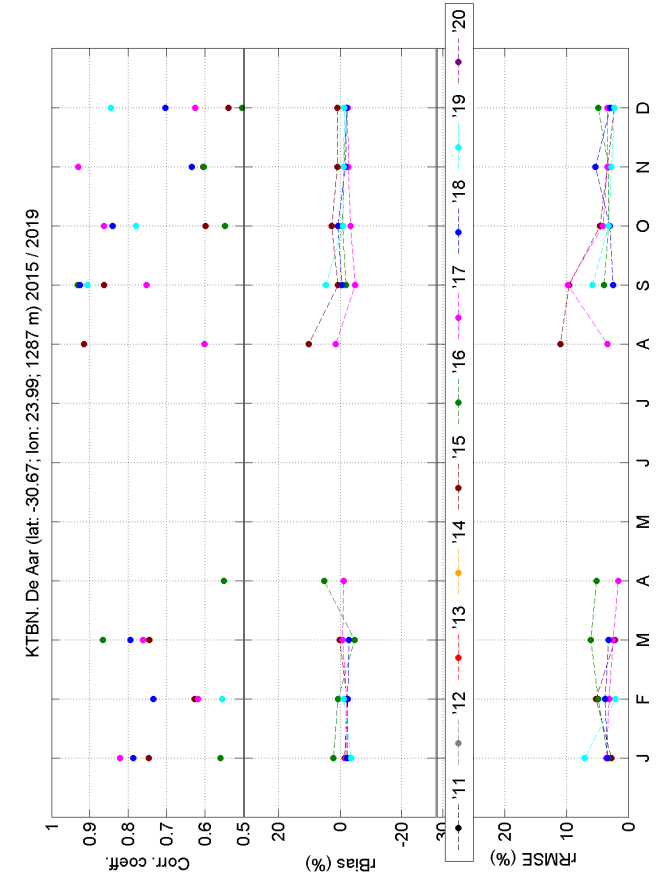
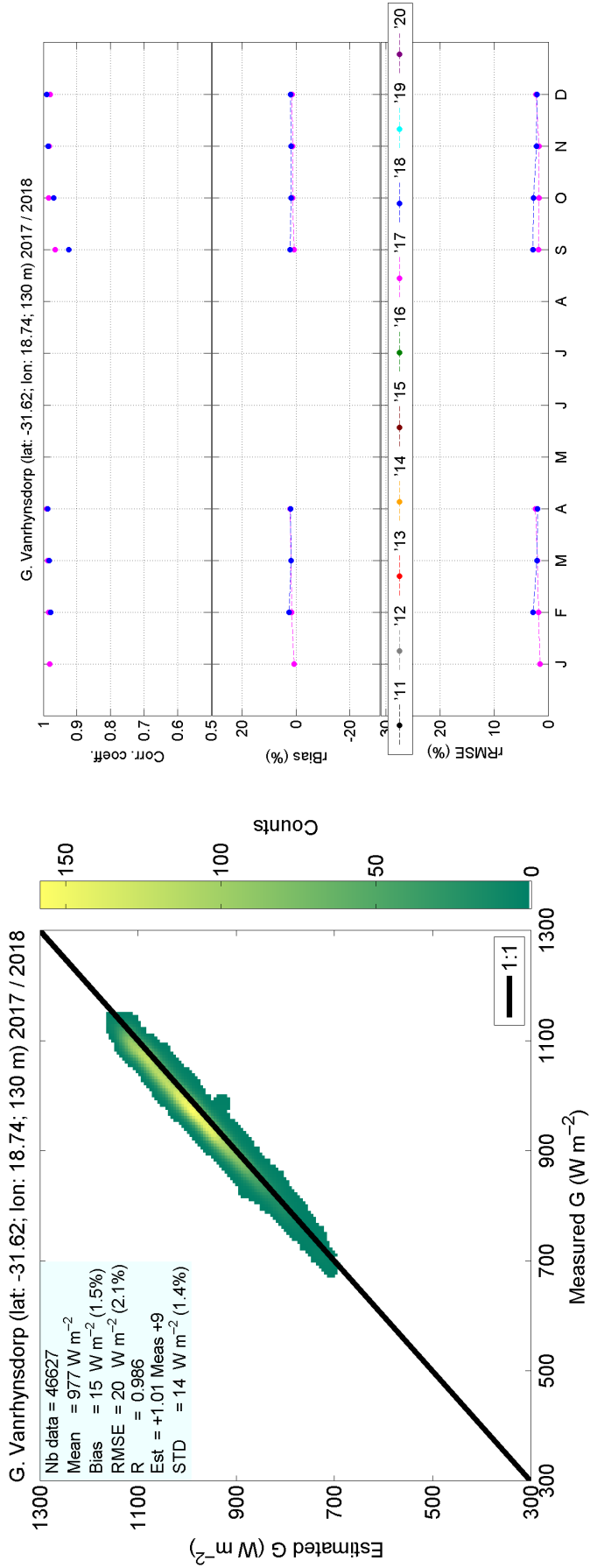


Figure S152: Comparison on direct clearness index at De Aar



G. Vanrhynsdorp (lat: -31.62; lon: 18.74; 130 m) 2017 / 2018

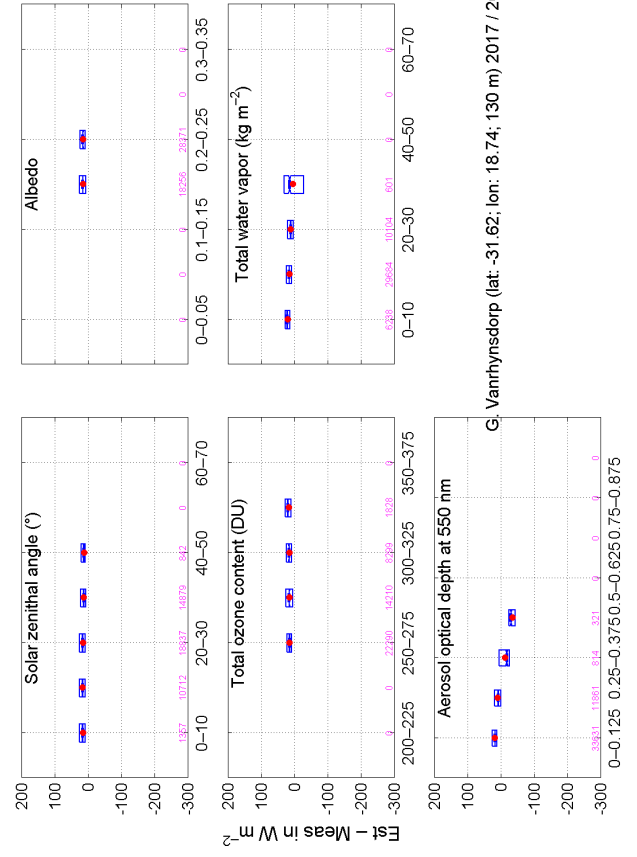
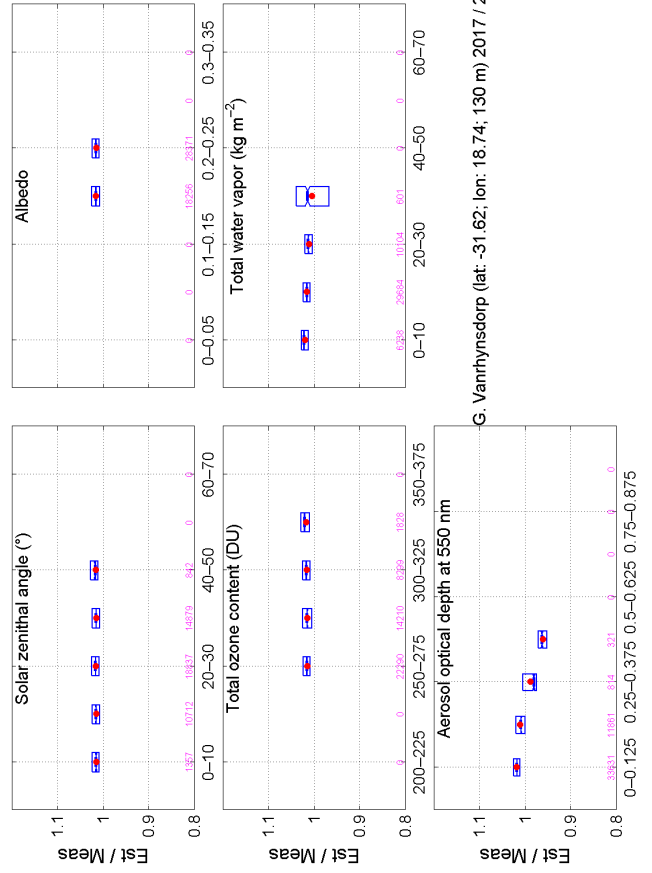
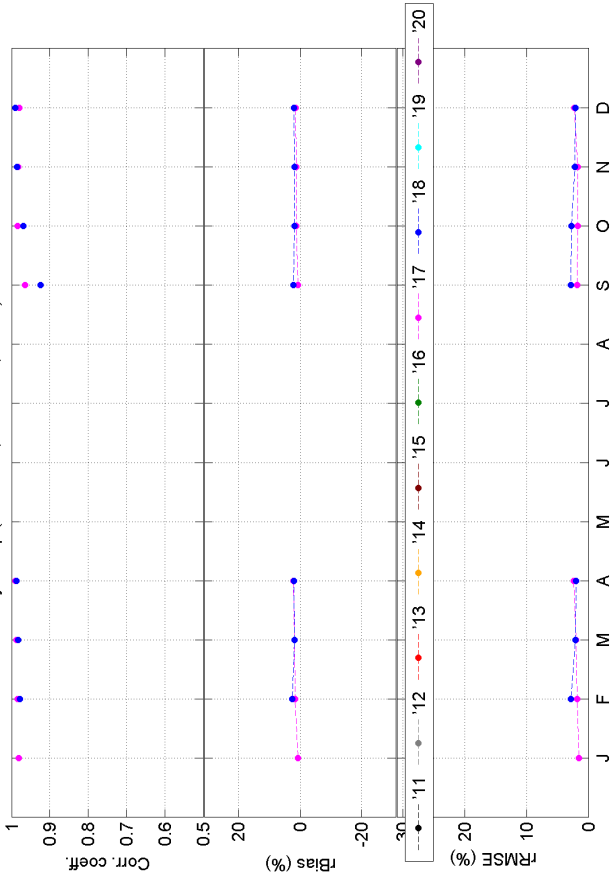


Figure S153: Comparison on global irradiance at Vanrhynsdorp

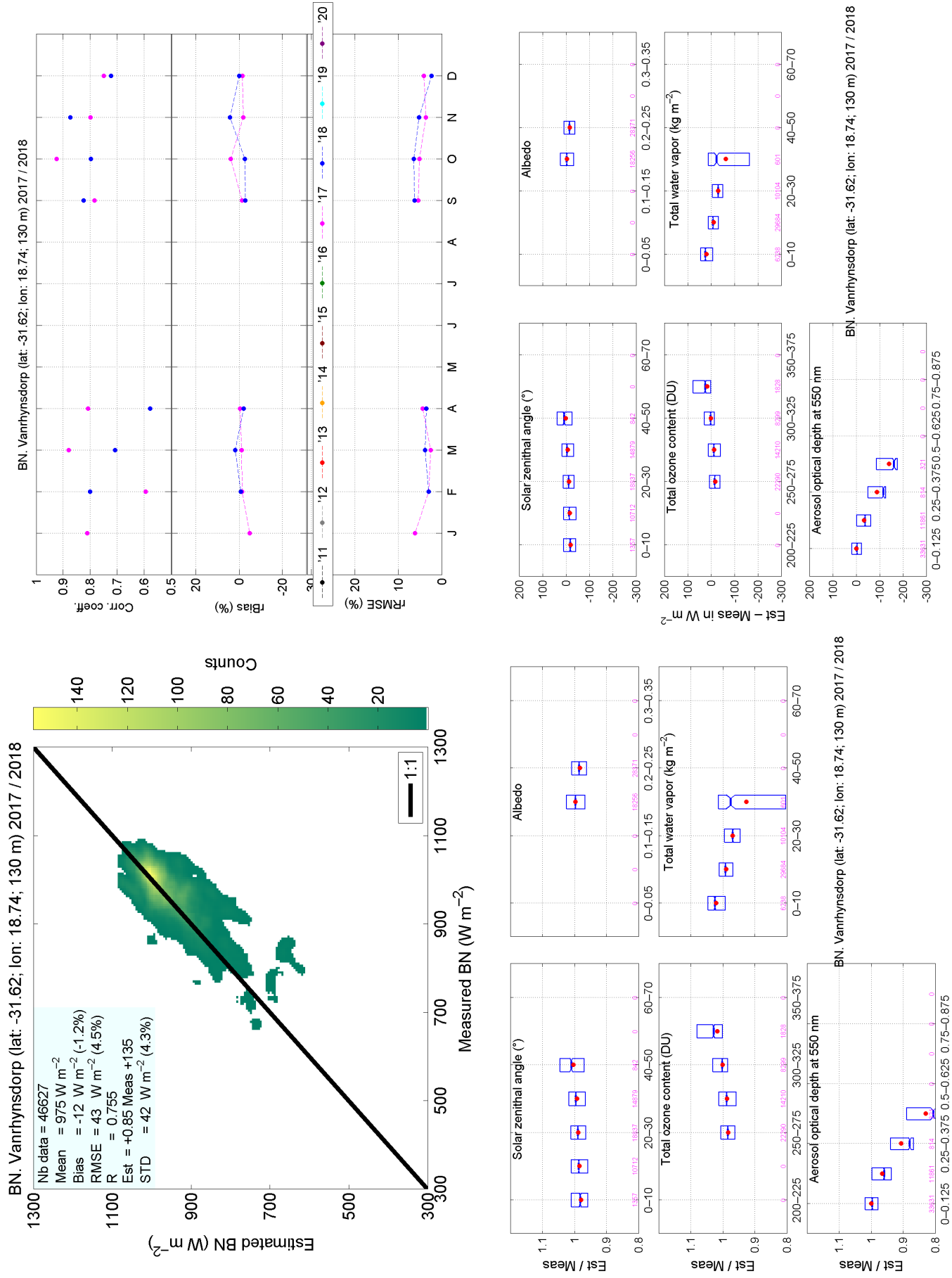


Figure S154: Comparison on direct component at normal irradiance at Vanrhynsdorp

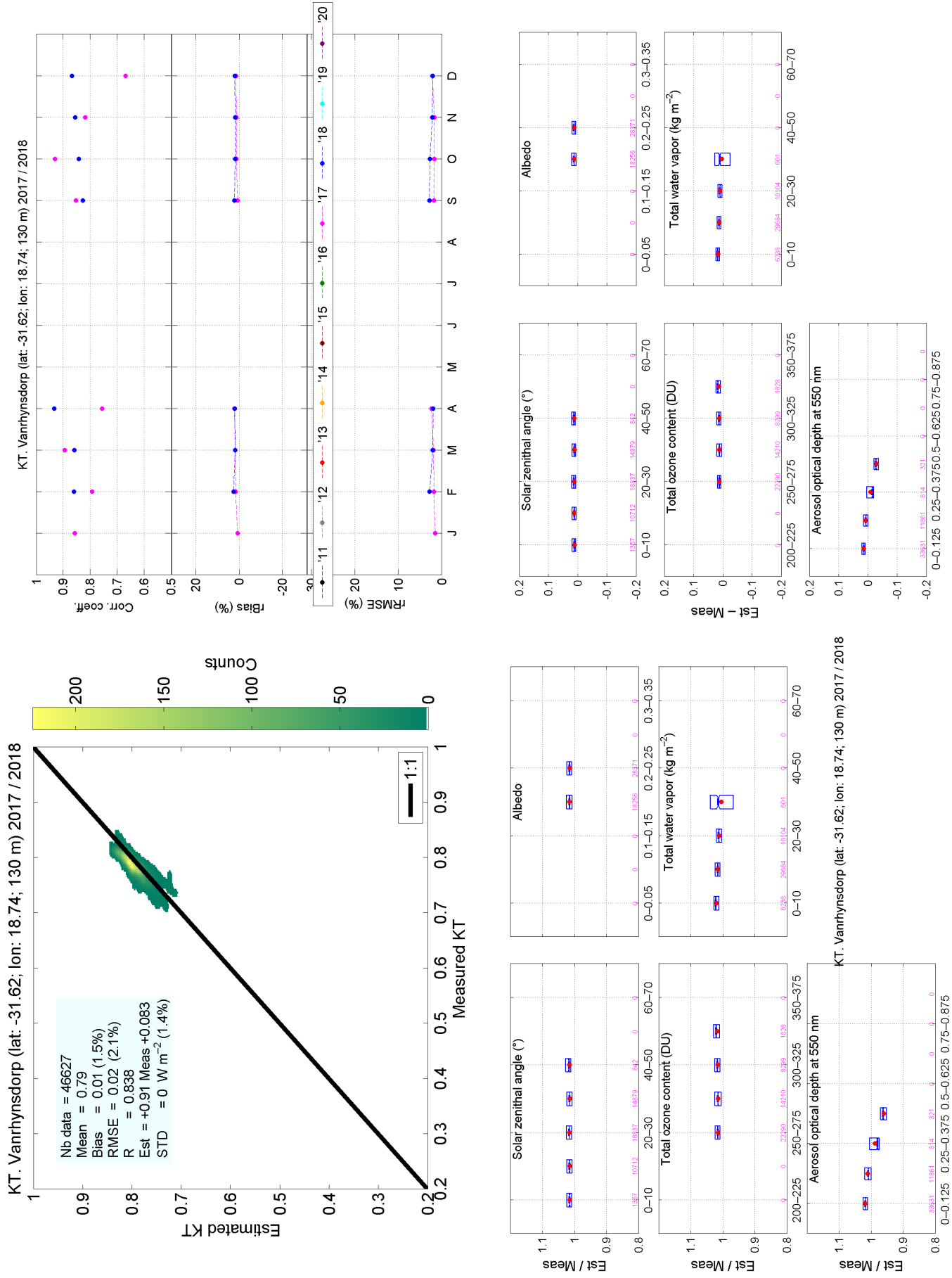


Figure S155: Comparison on clearness index at Vamrhynsdorp

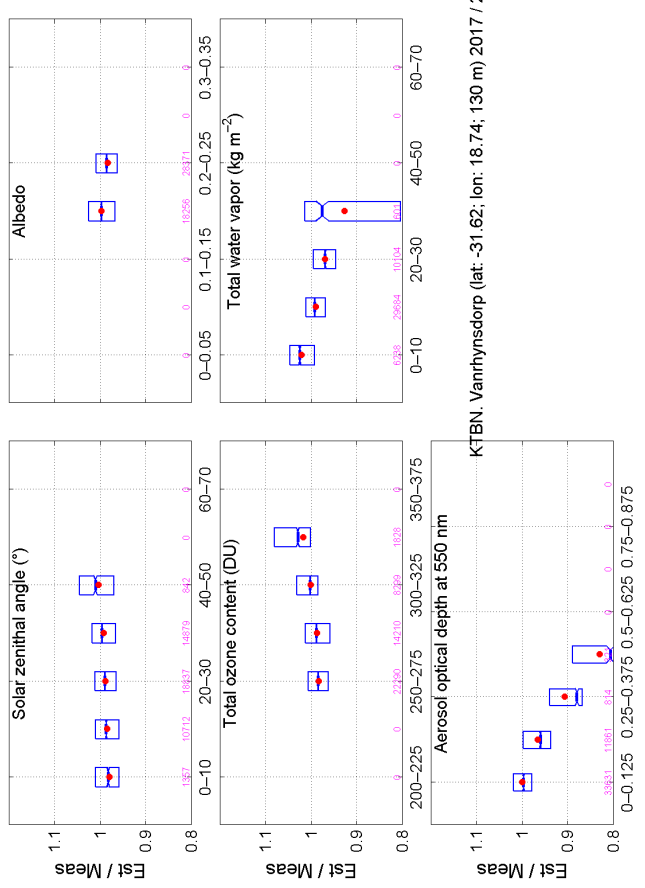
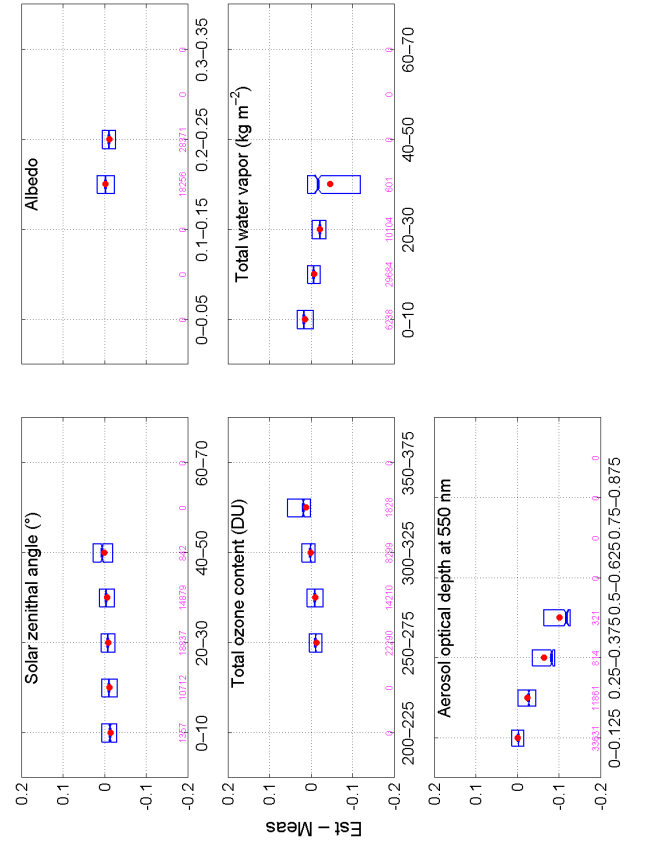
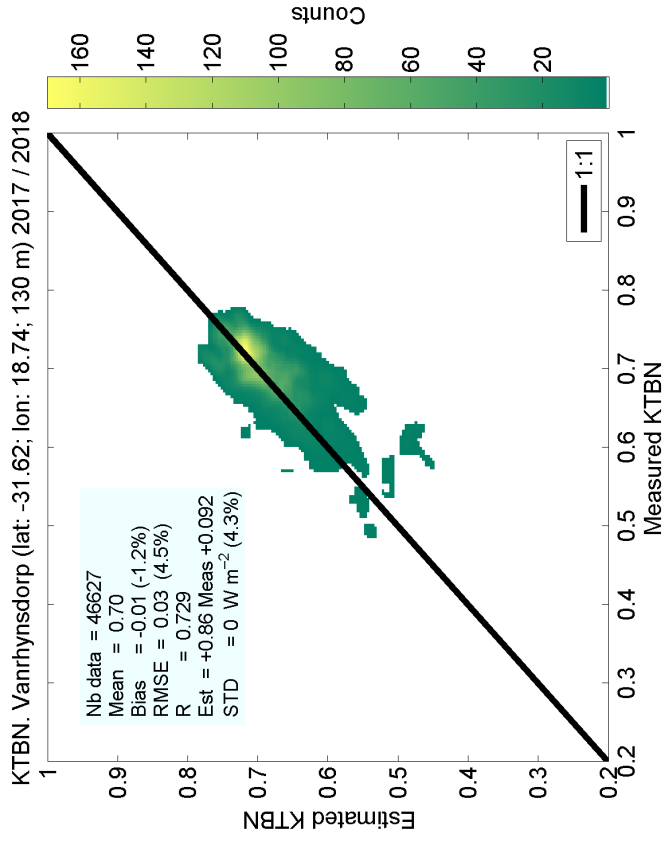
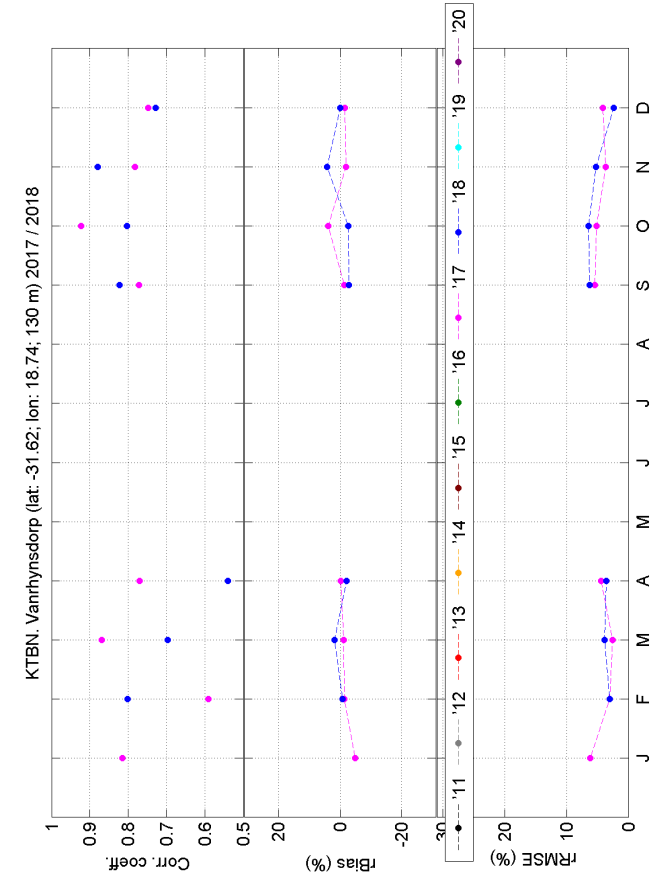


Figure S156: Comparison on direct clearness index at Vanrhynsdorp

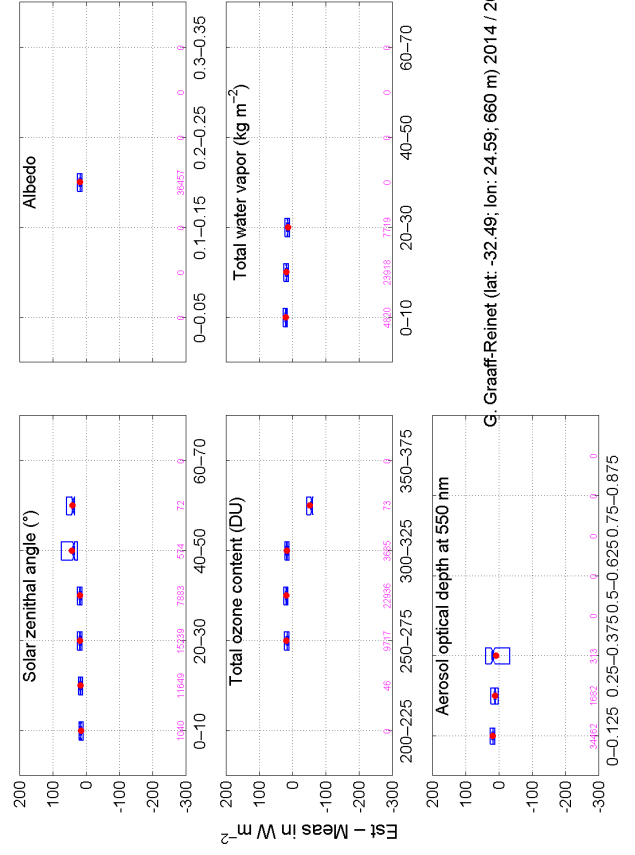
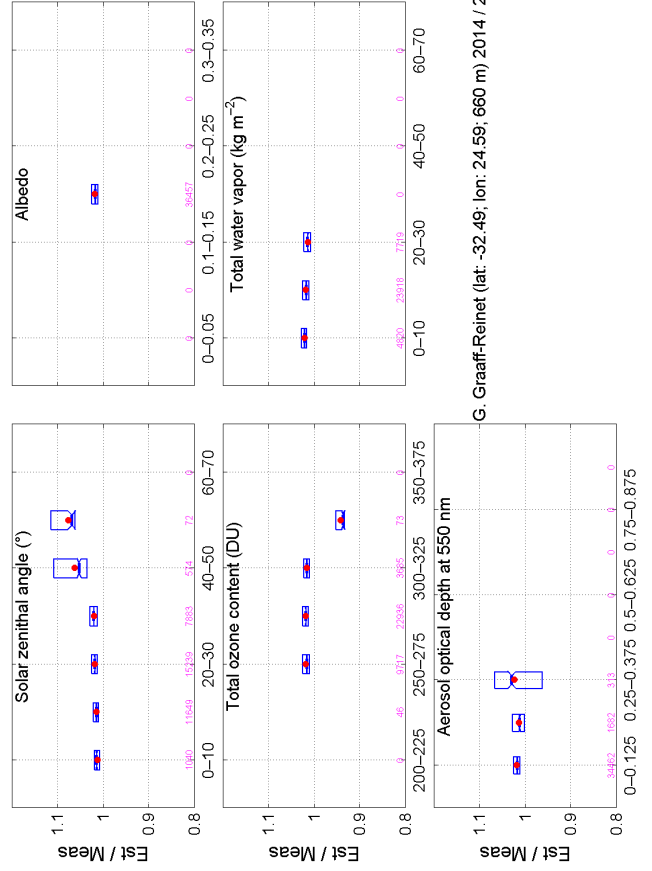
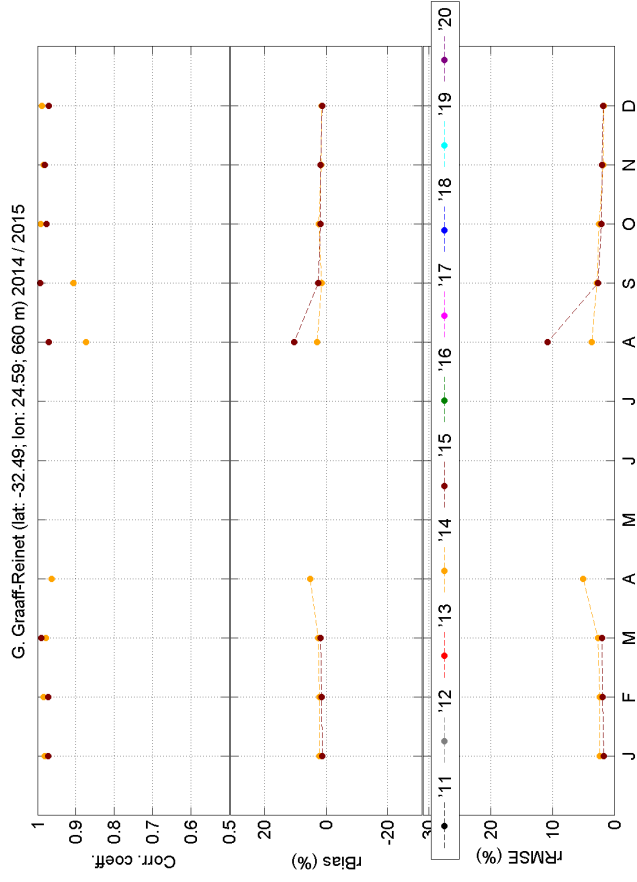
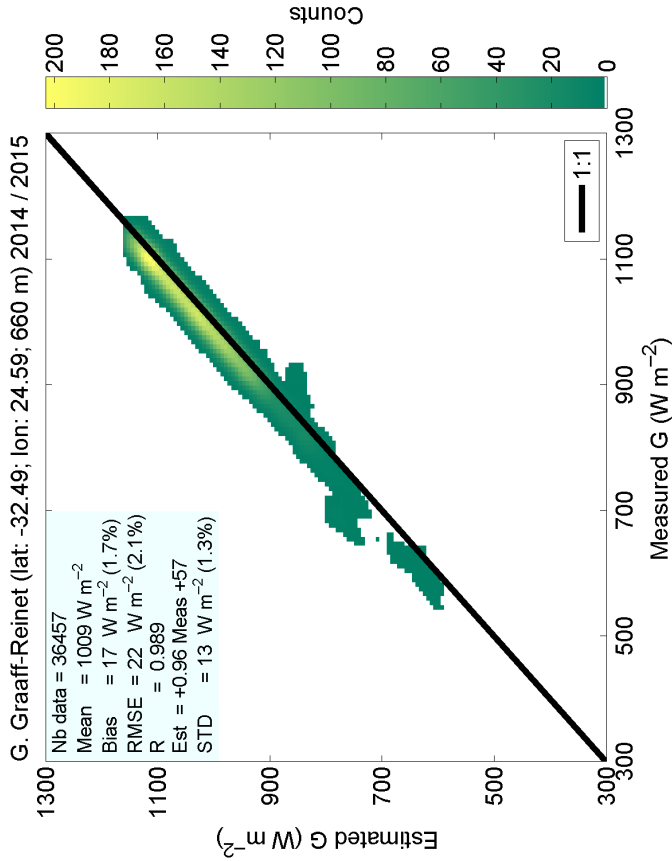
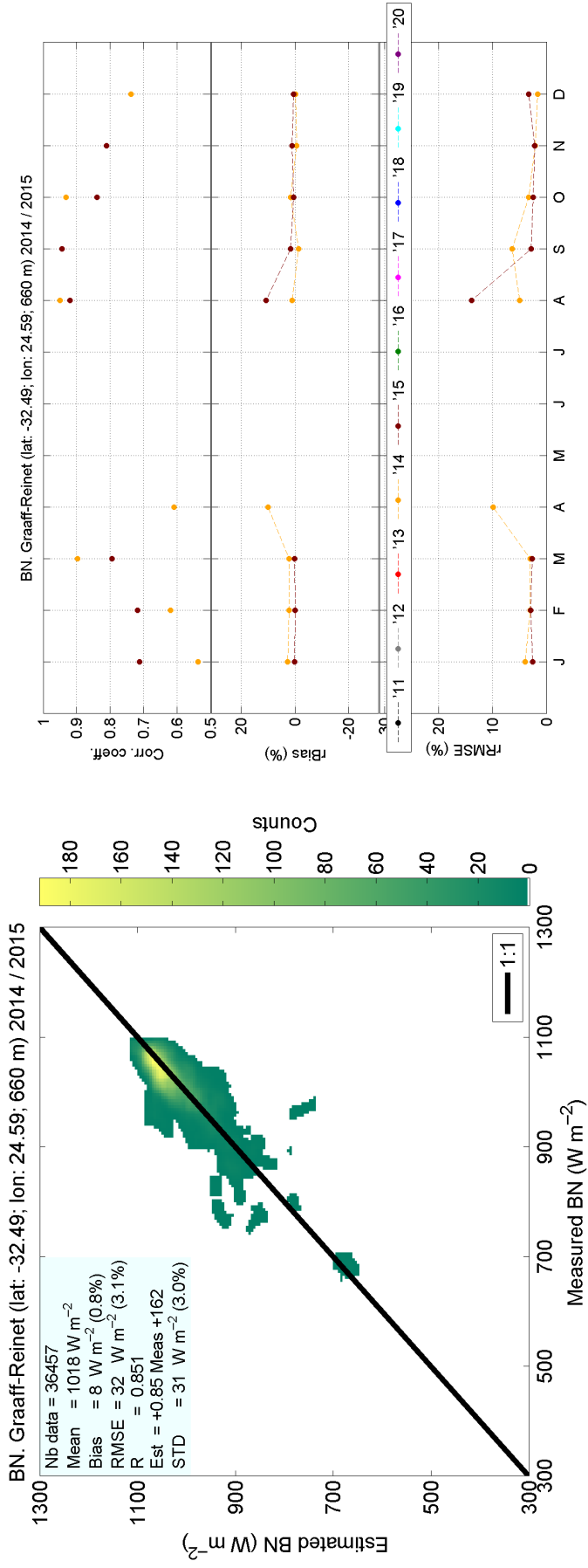


Figure S157: Comparison on global irradiance at Graaff-Reinet



BN. Graaff-Reinet (lat: -32.49; lon: 24.59; 660 m) 2014 / 2015

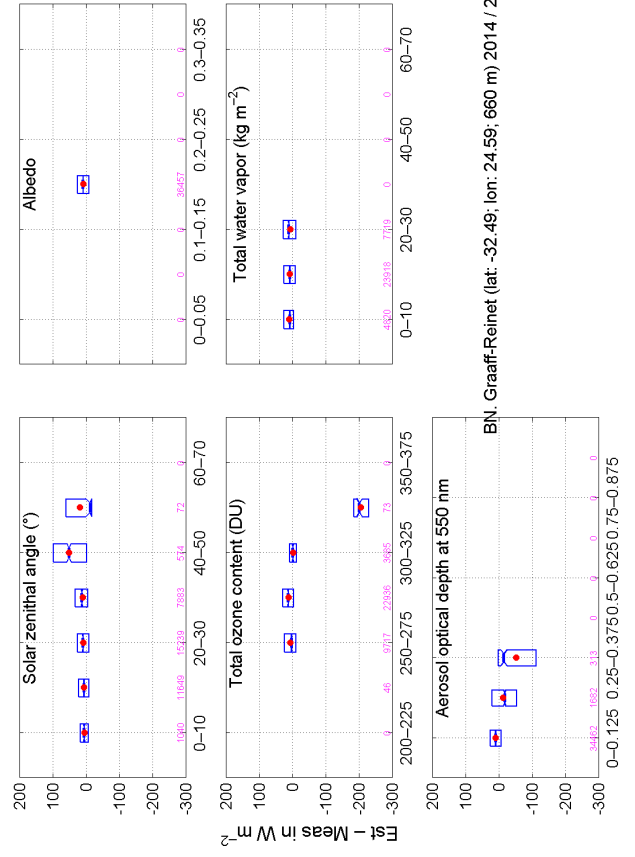
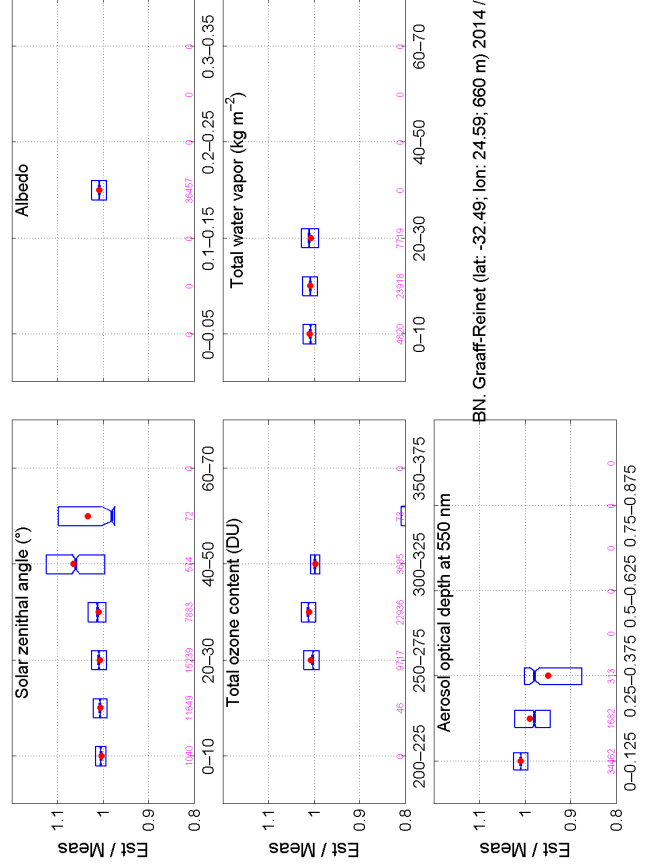
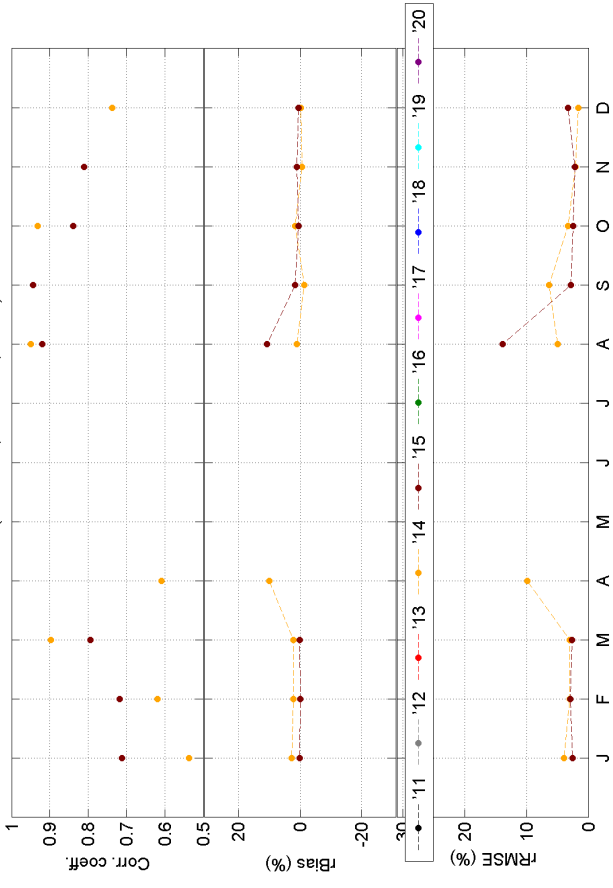


Figure S158: Comparison on direct component at normal irradiance at Graaff-Reinet

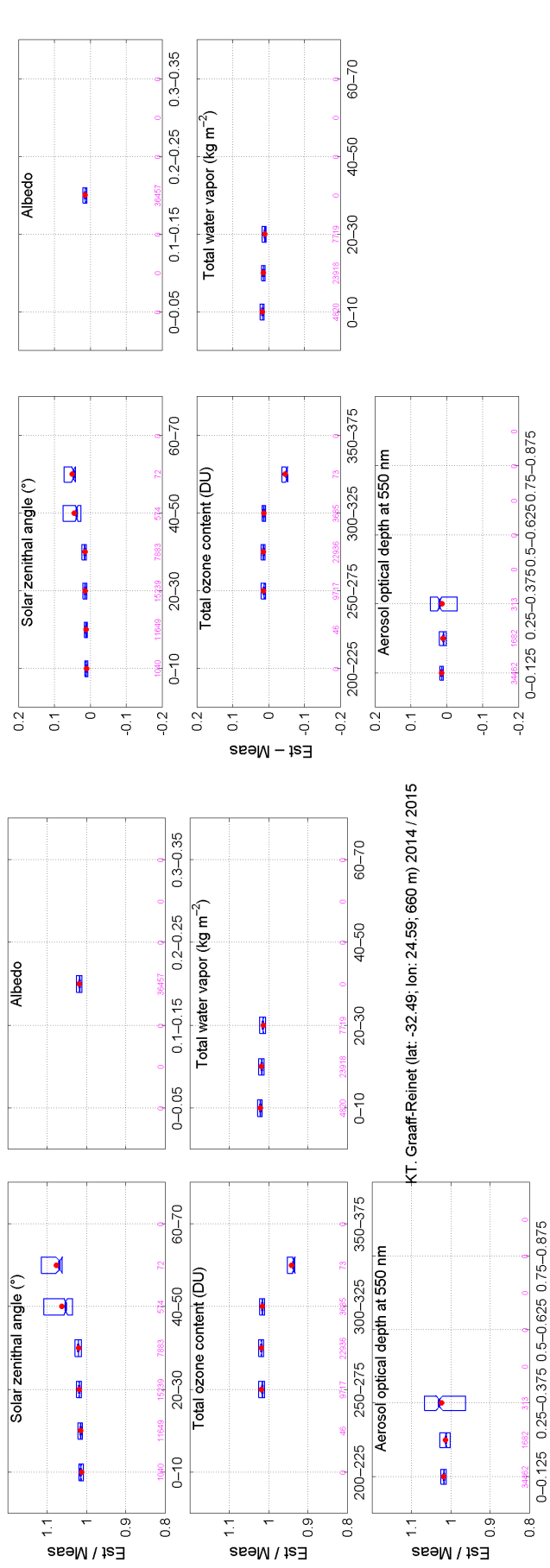
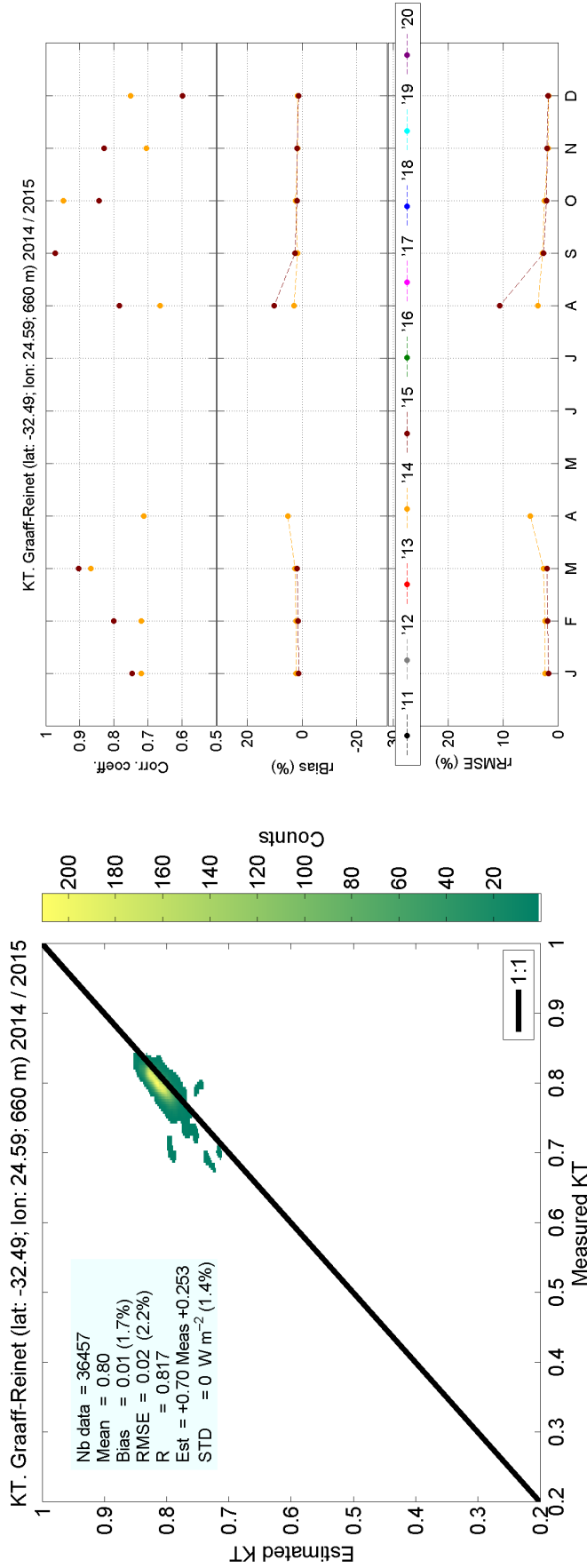


Figure S159: Comparison on clearness index at Graaff-Reinet

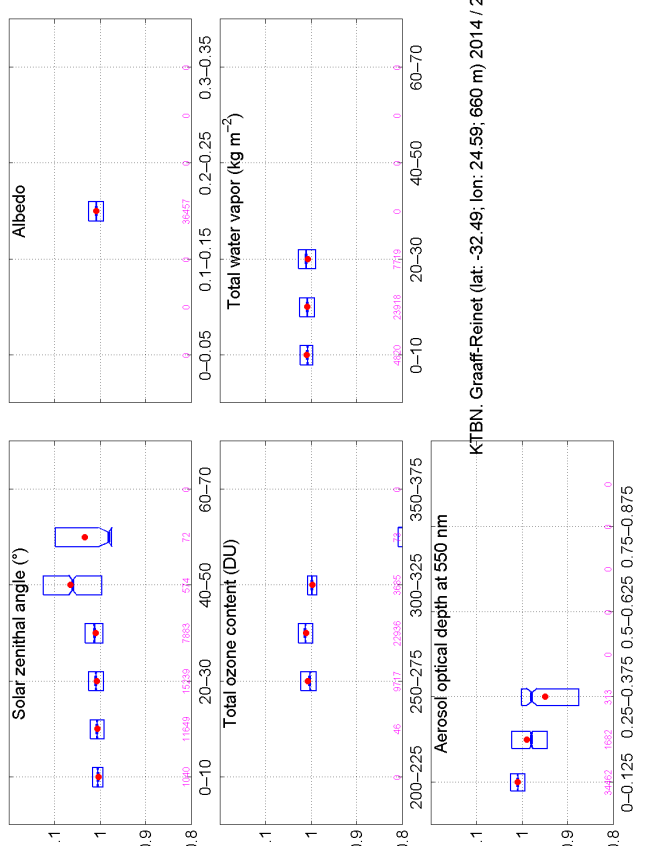
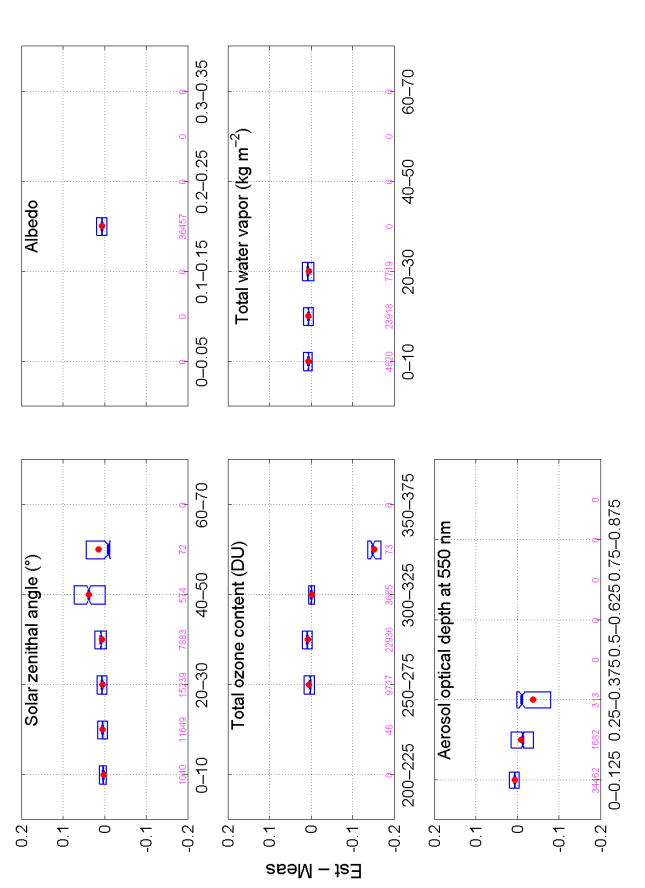
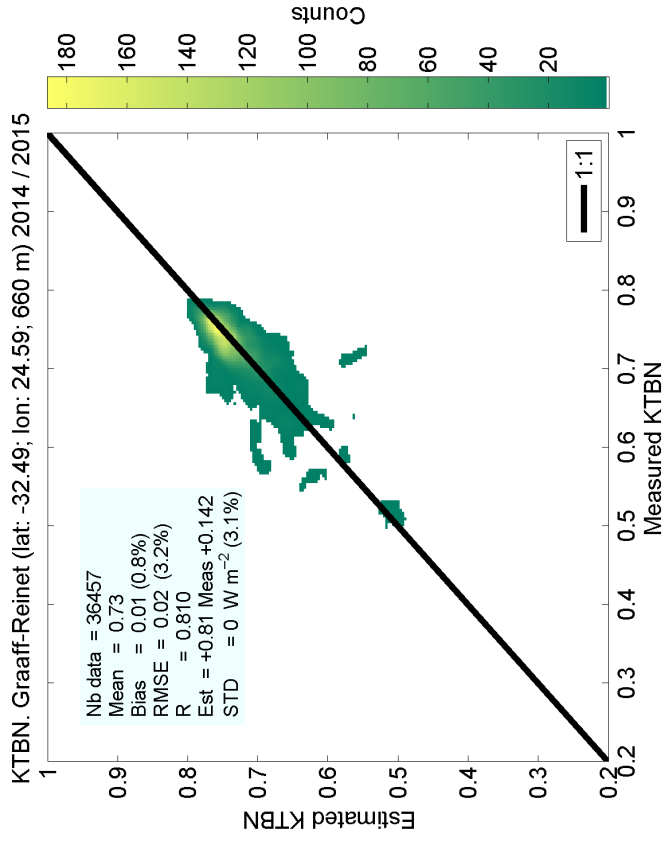
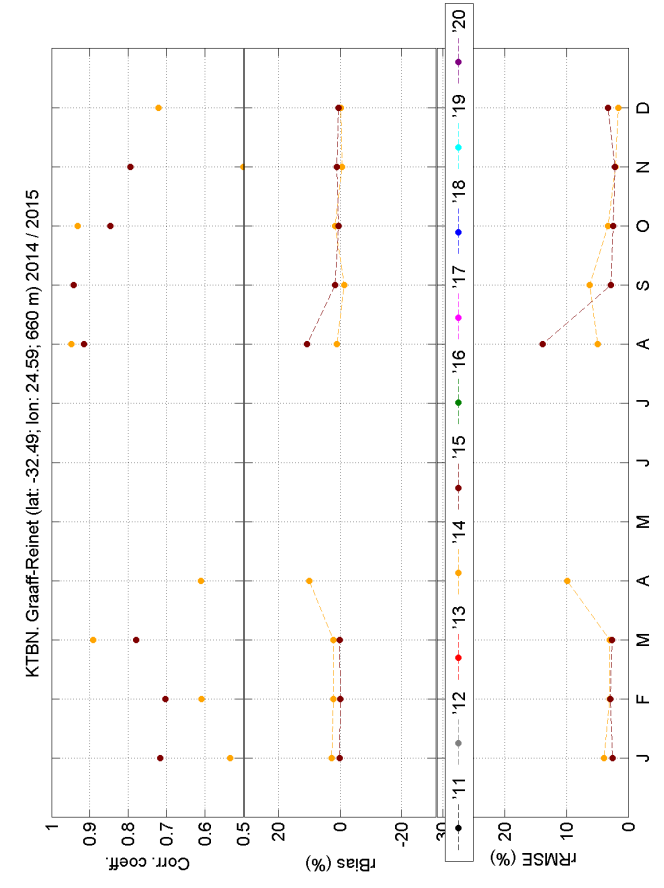


Figure S160: Comparison on direct clearness index at Graaff-Reinet

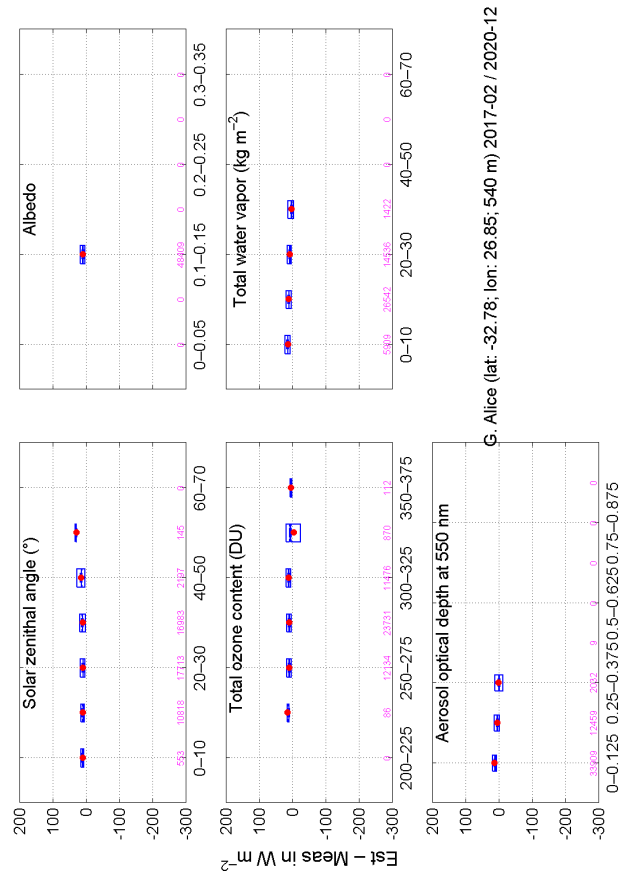
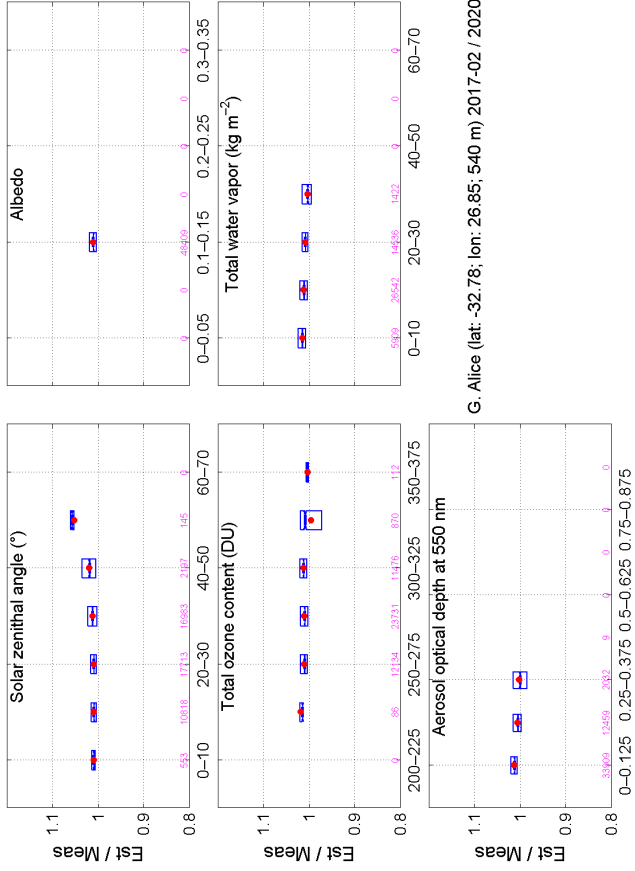
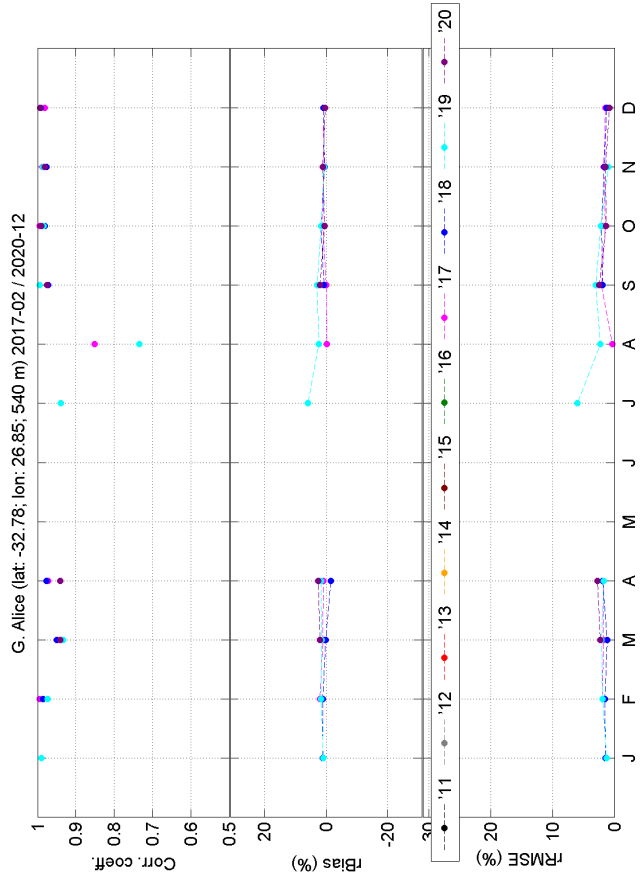
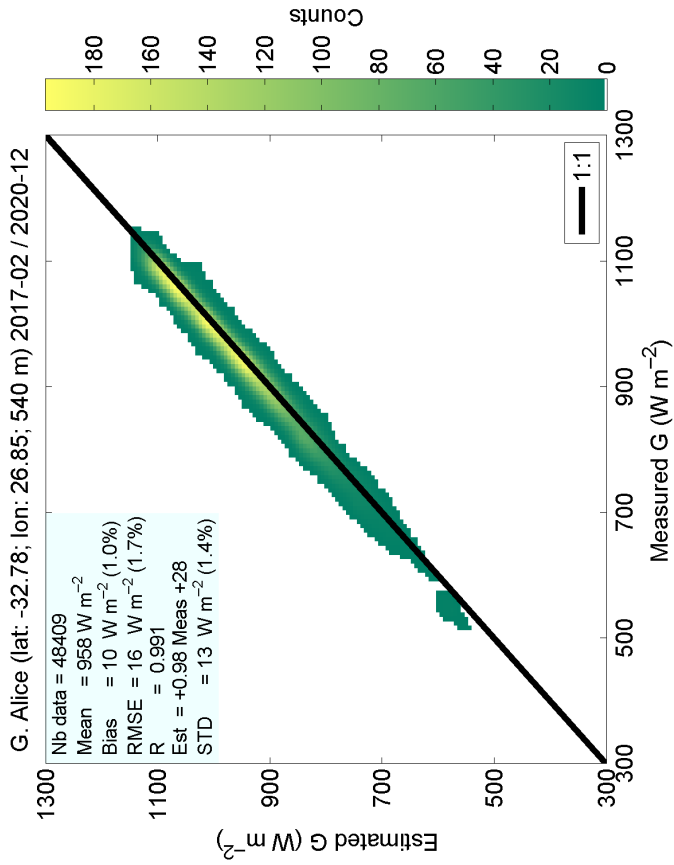


Figure S161: Comparison on global irradiance at Alice

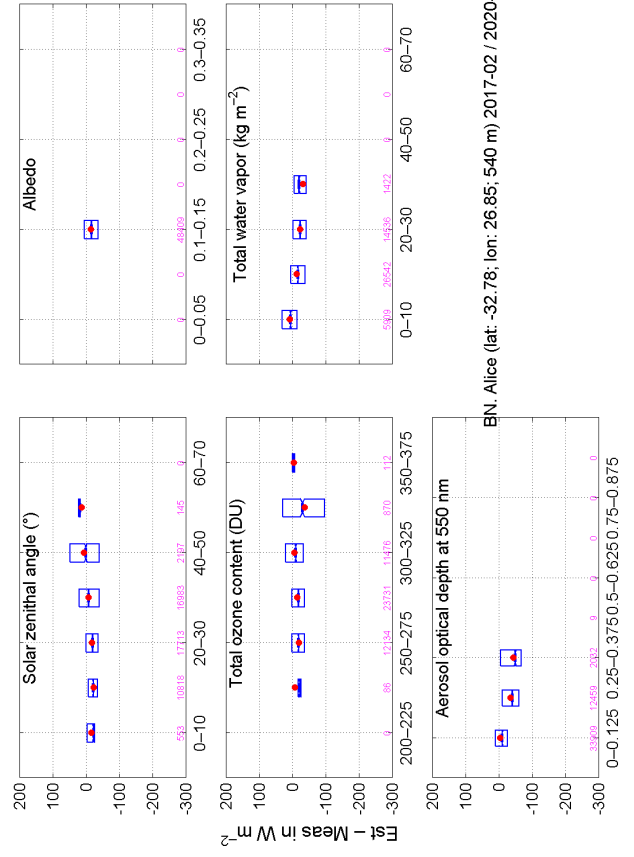
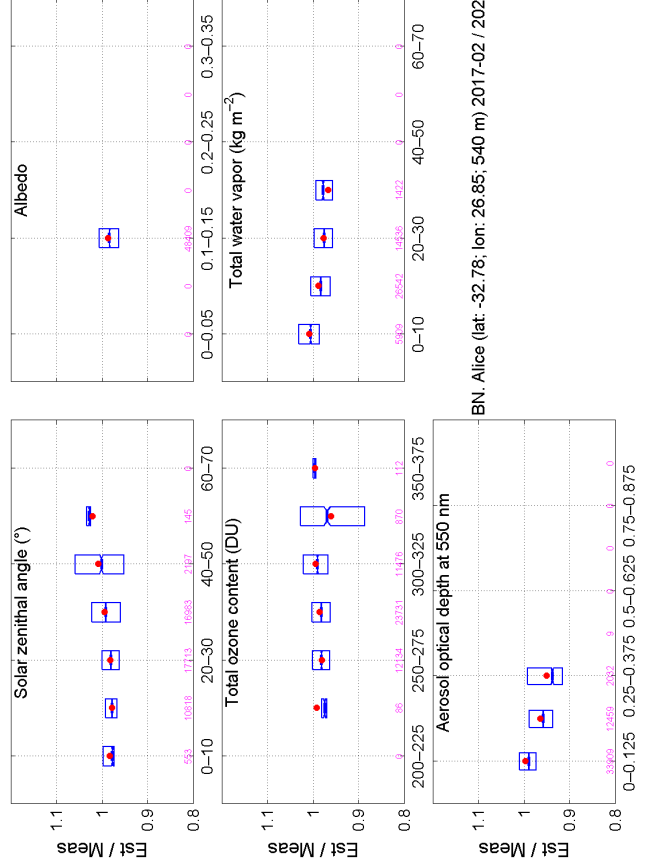
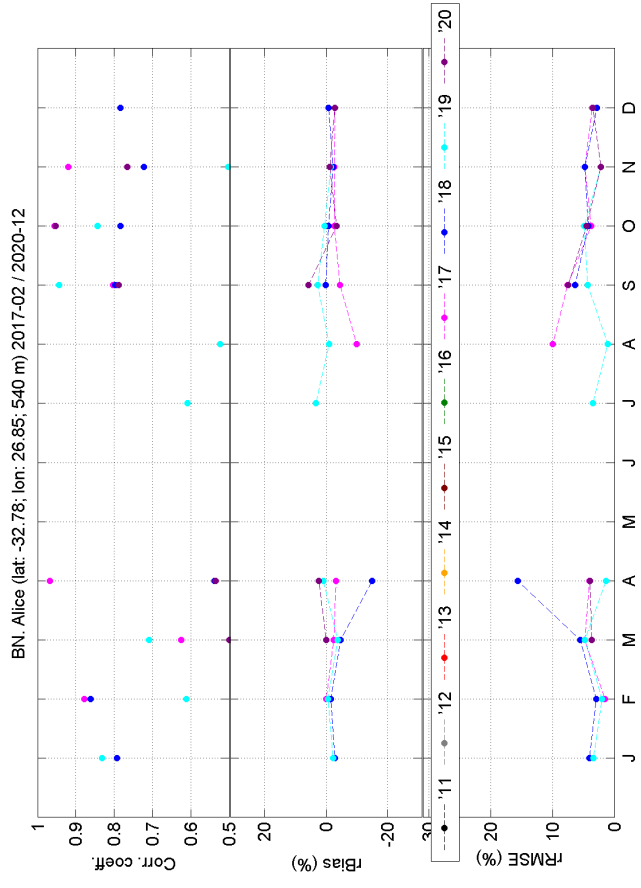
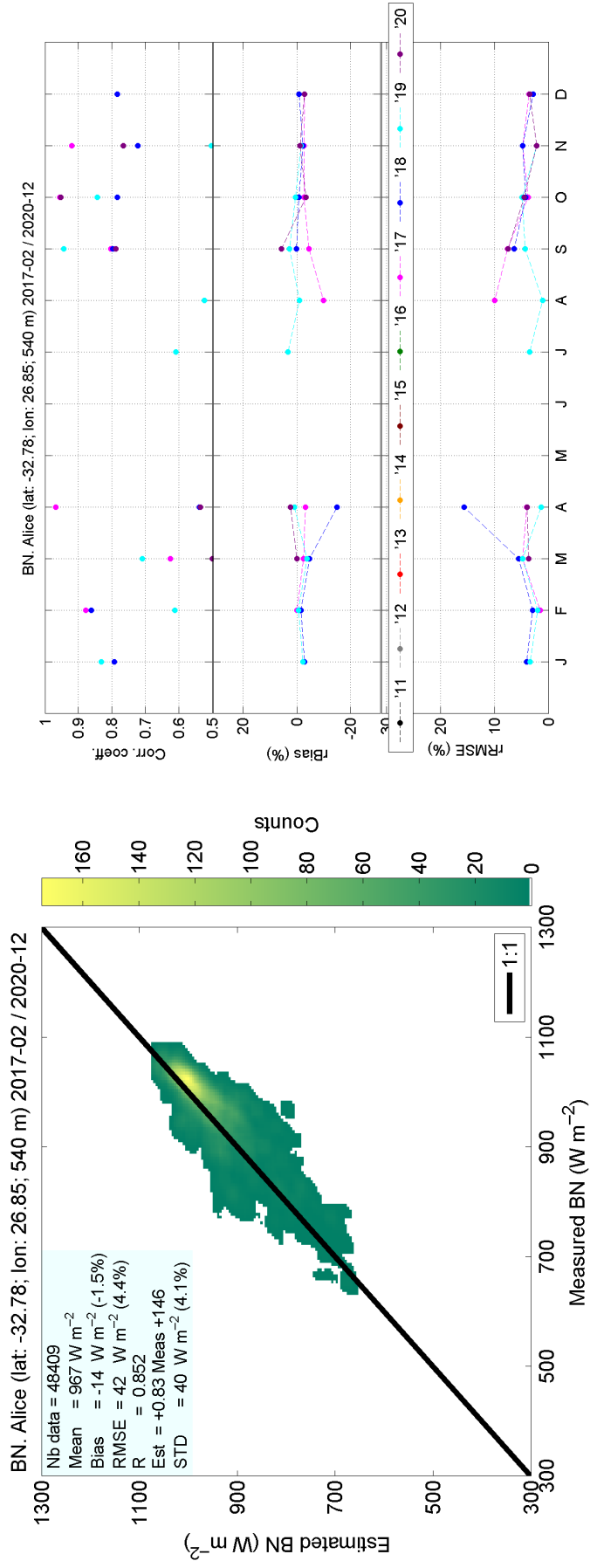


Figure S162: Comparison on direct component at normal irradiance at Alice

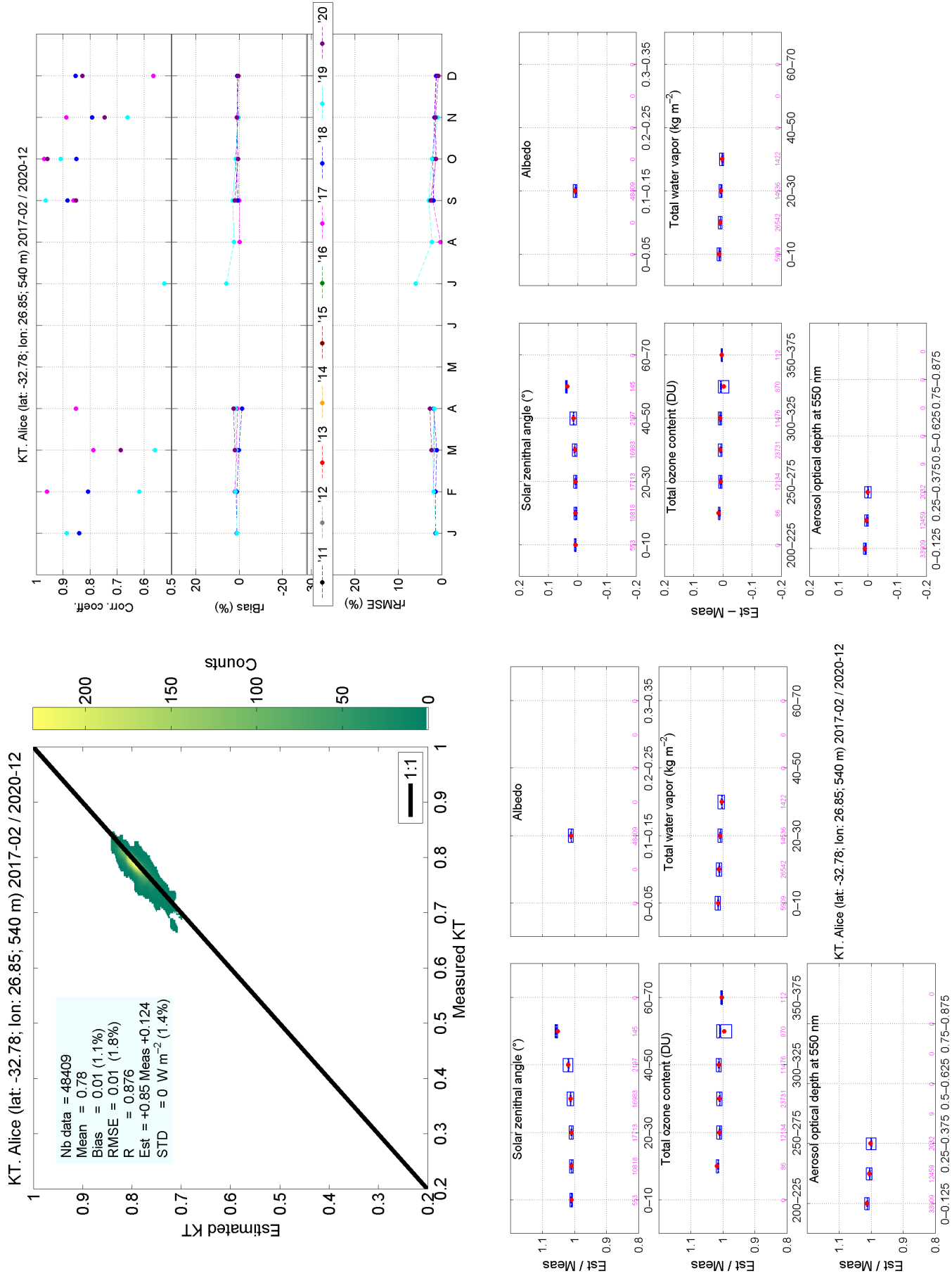


Figure S163: Comparison on clearness index at Alice

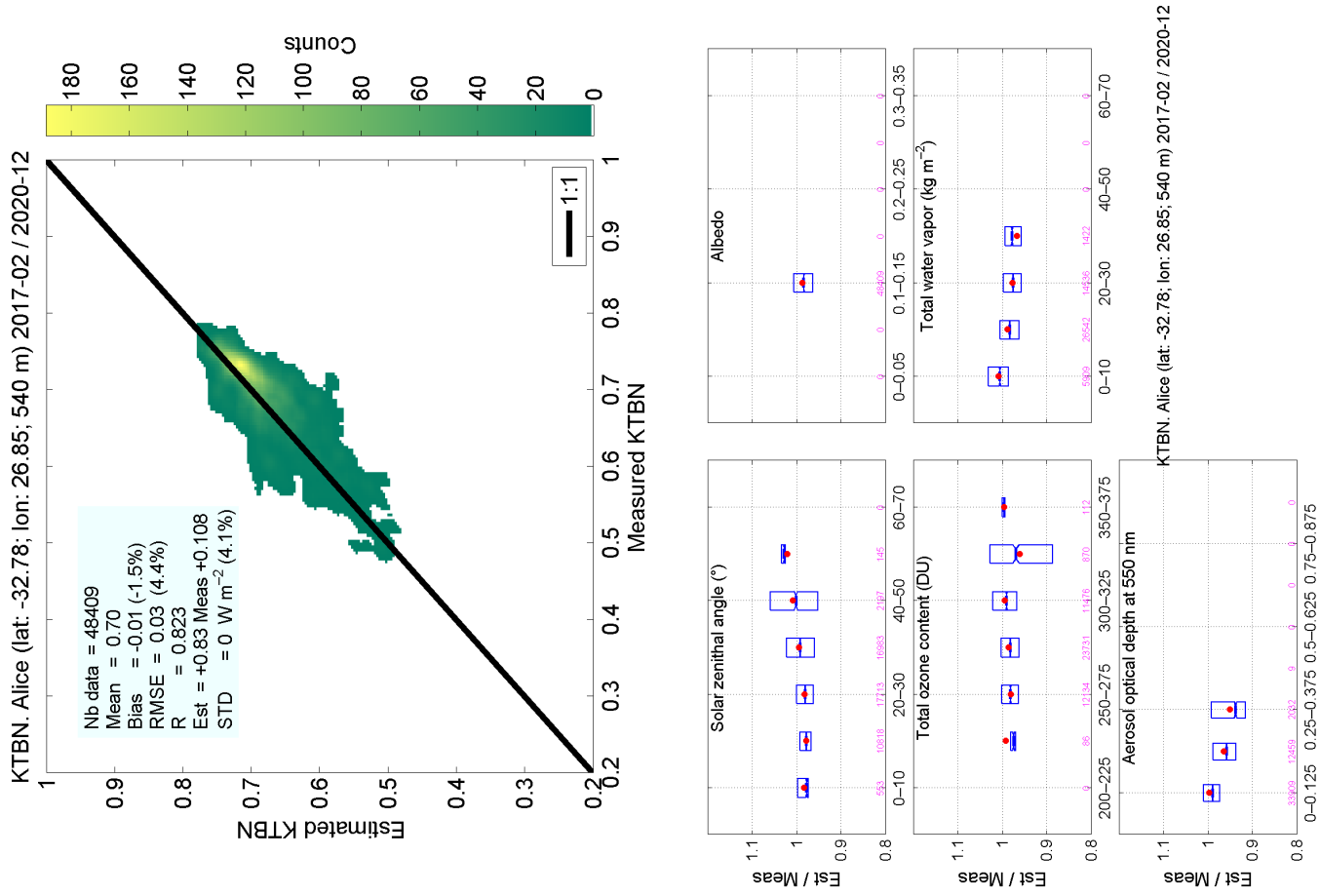
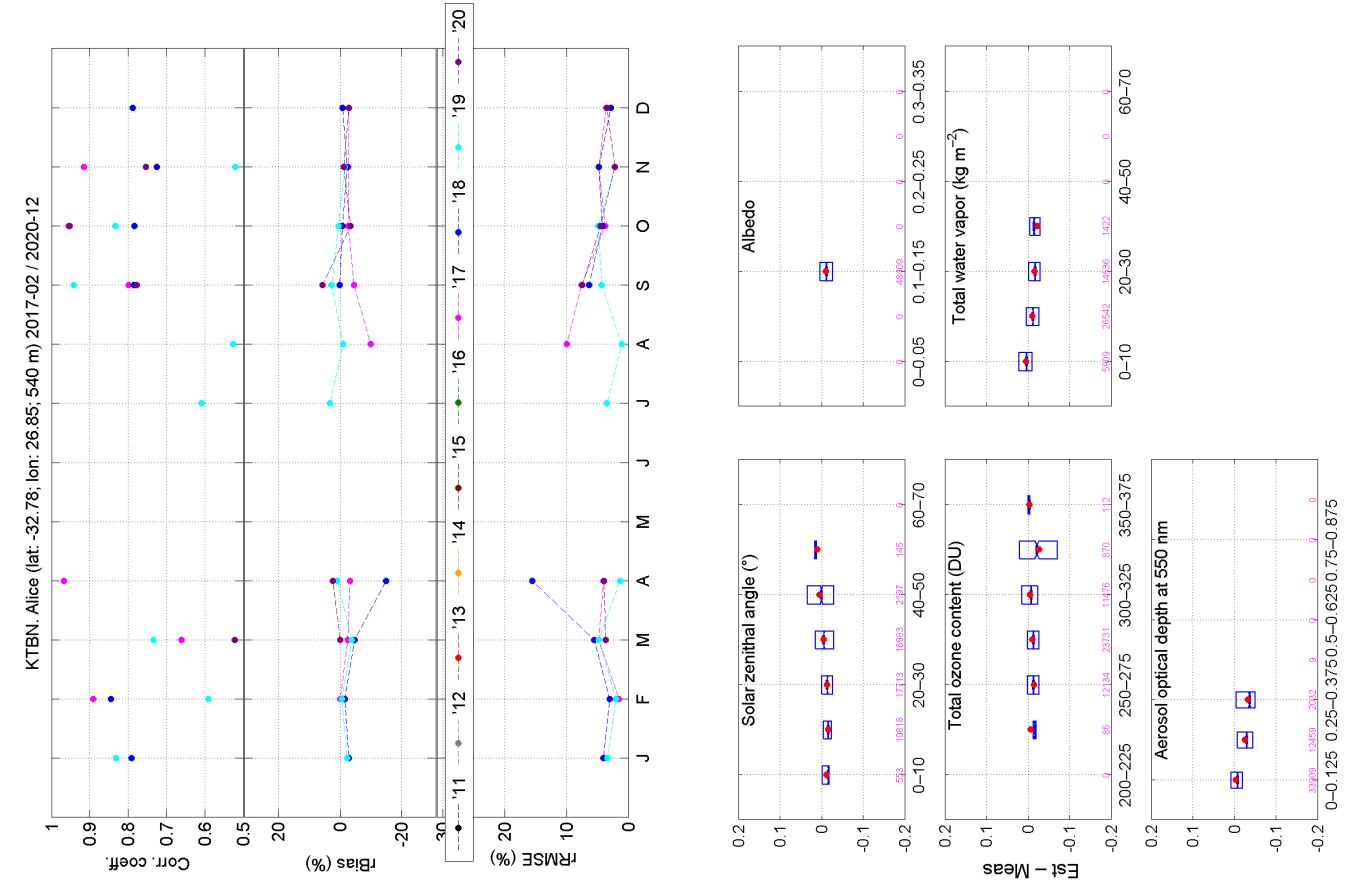


Figure S164: Comparison on direct clearness index at Alice

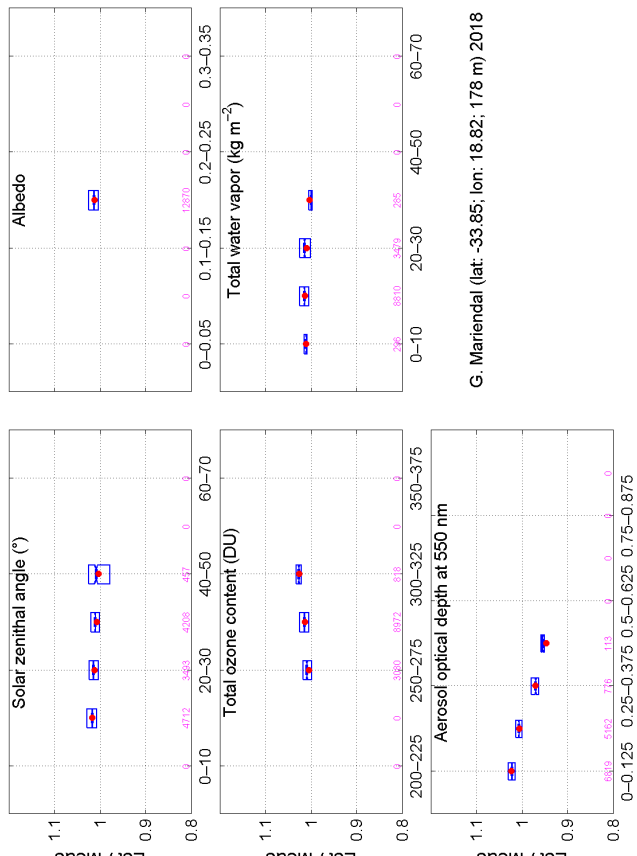
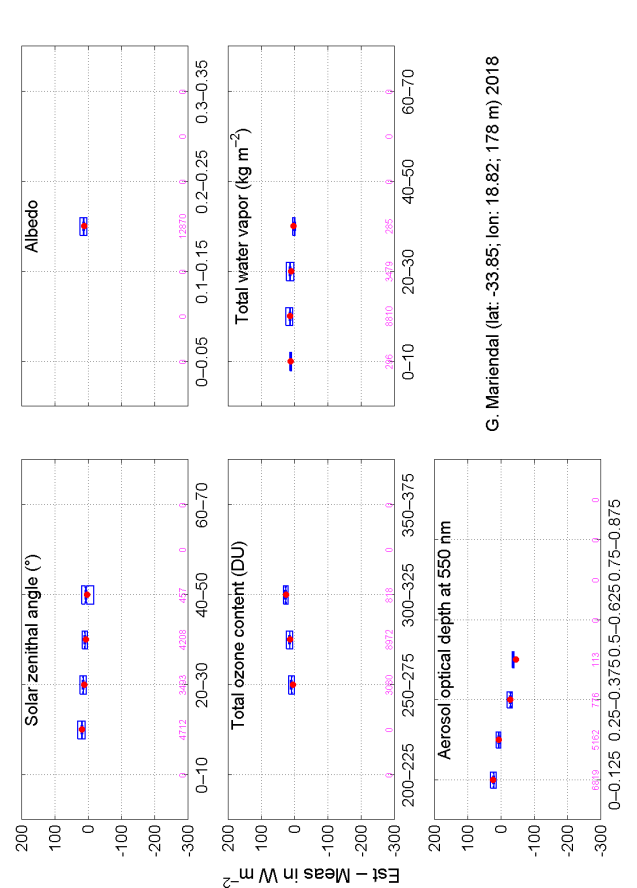
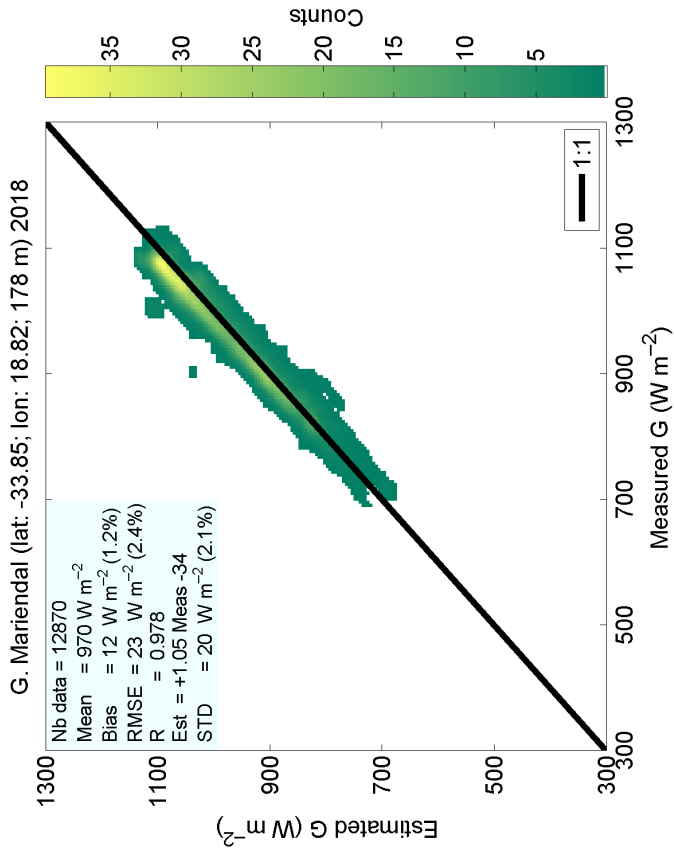
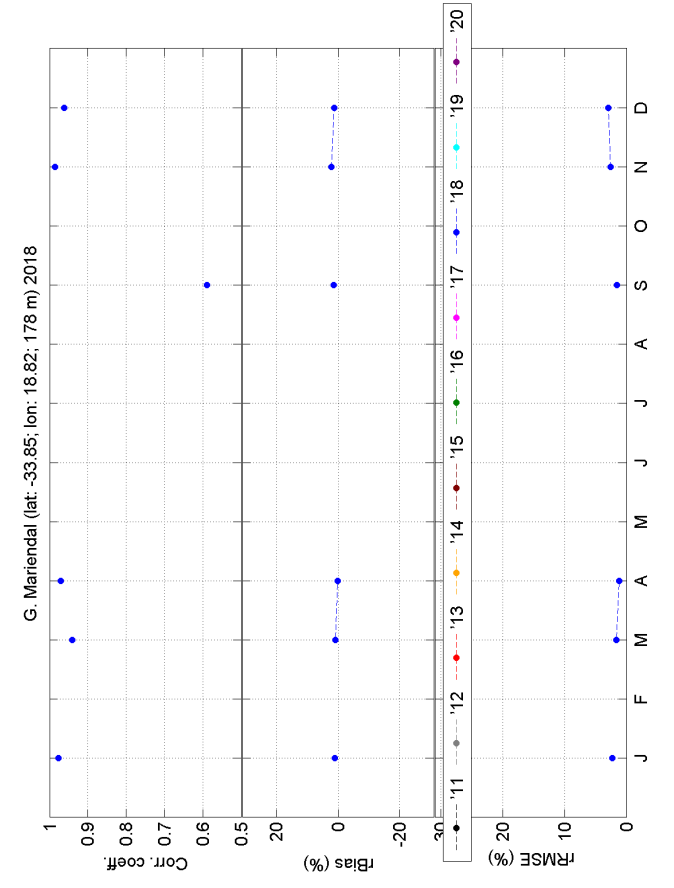


Figure S165: Comparison on global irradiance at Mariendal

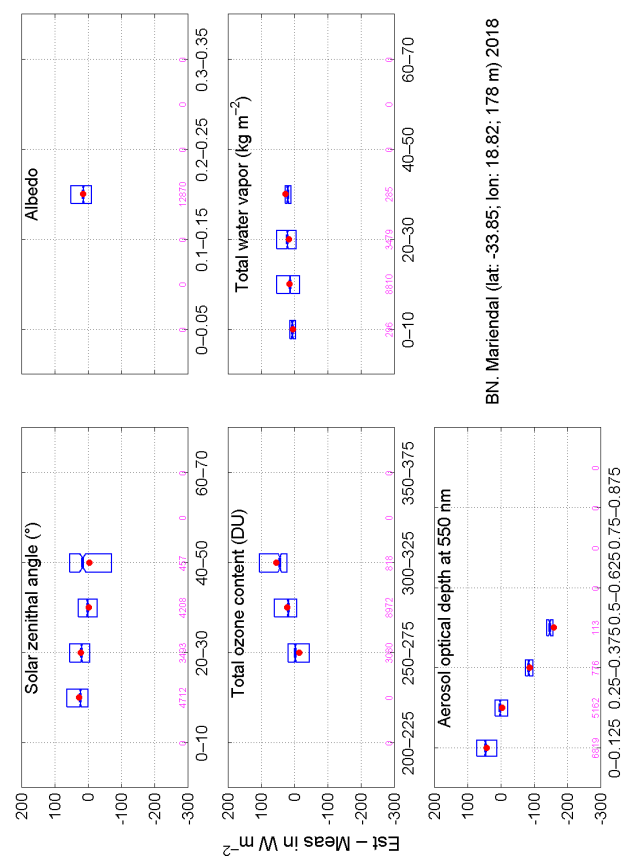
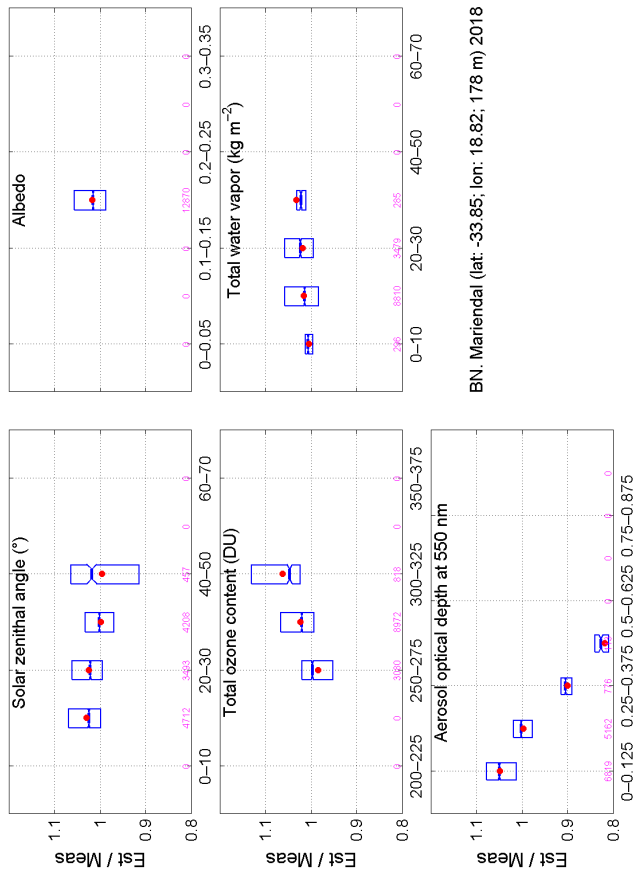
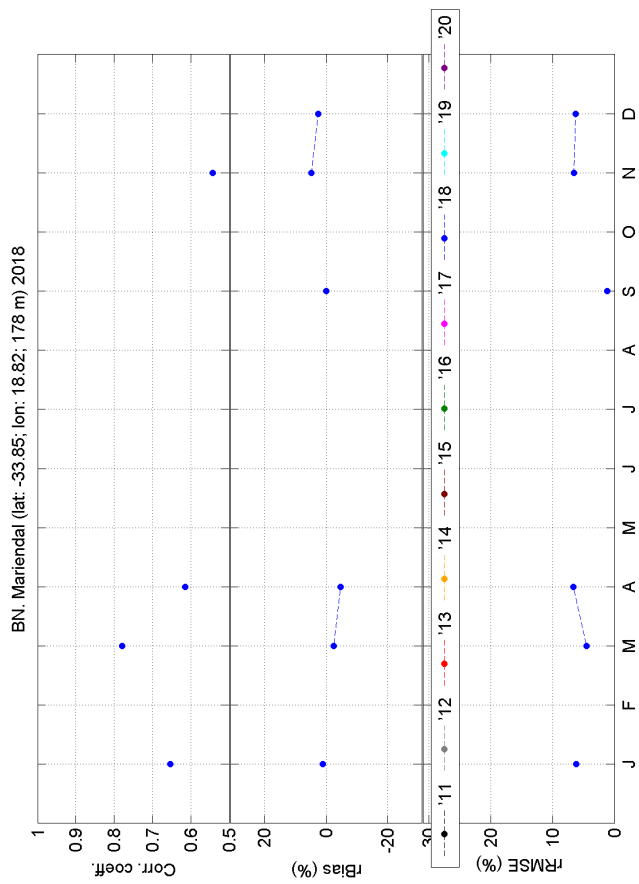
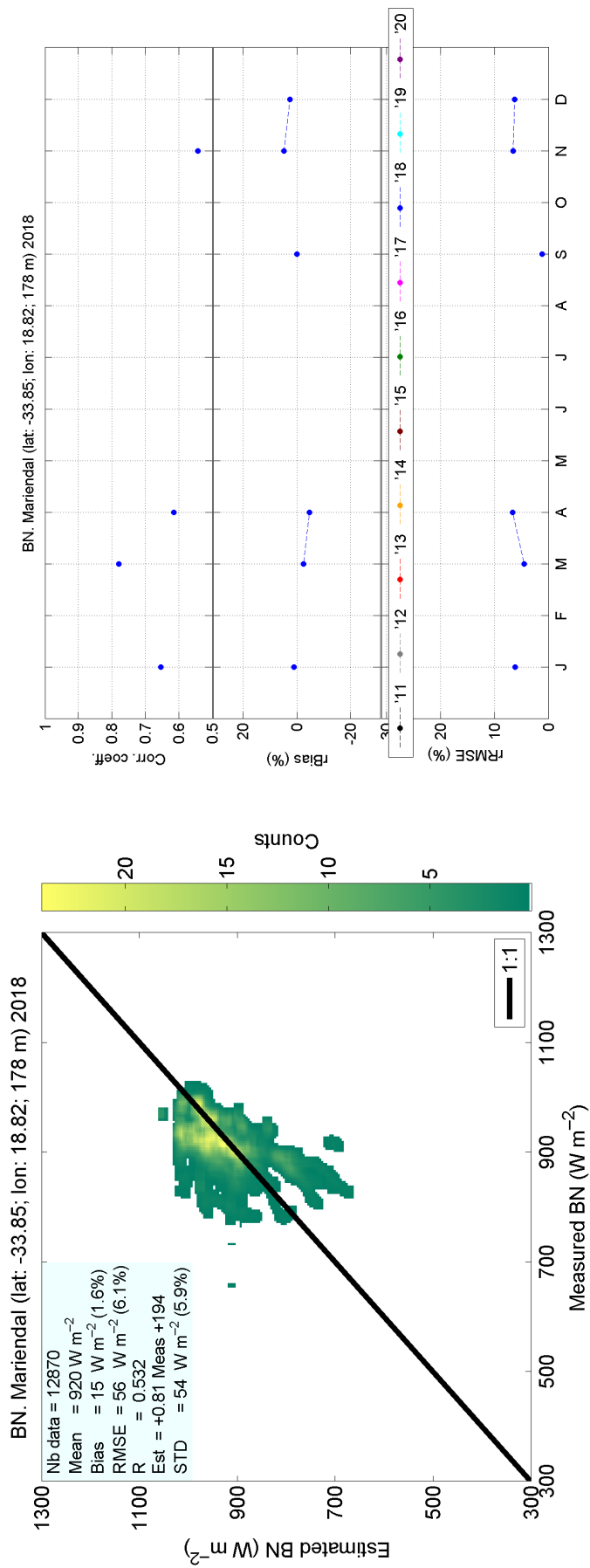
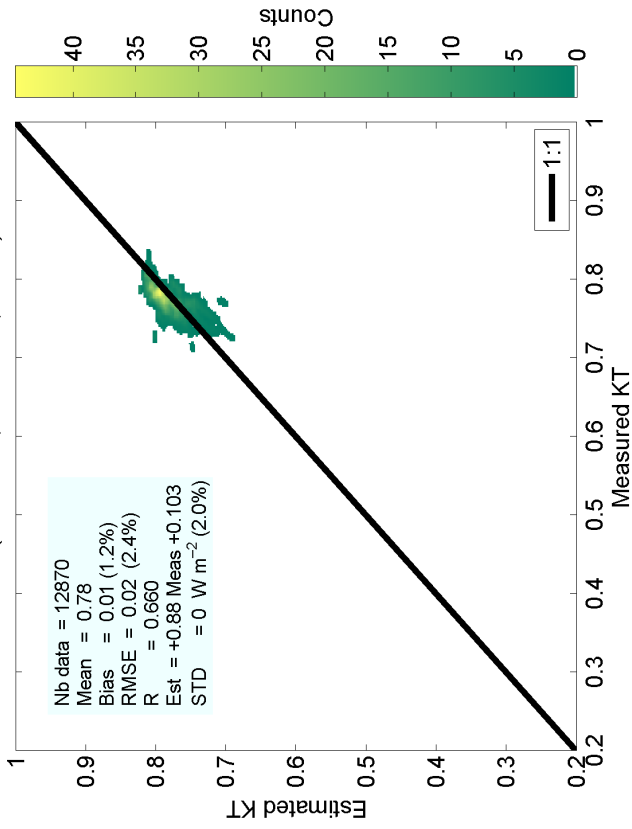
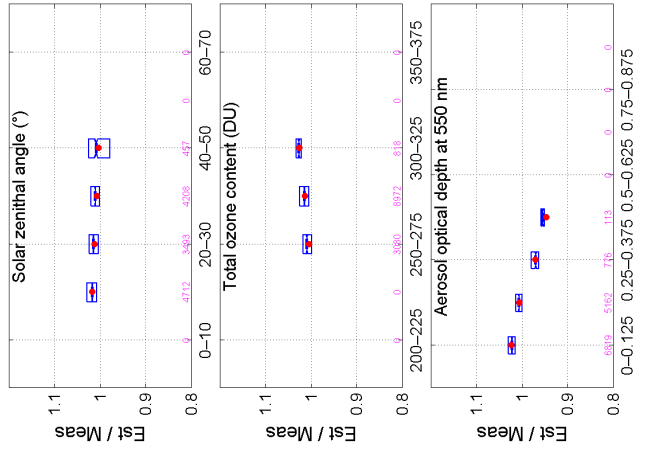
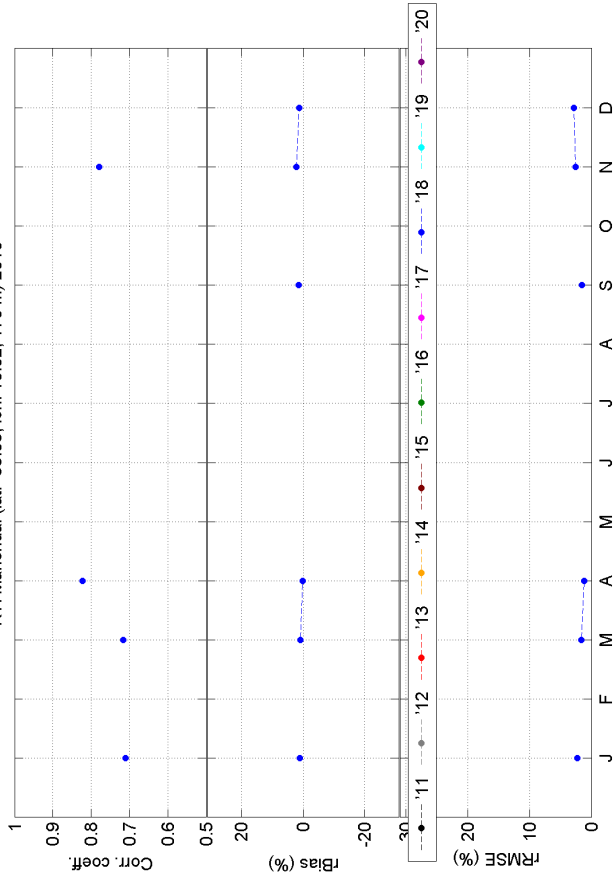


Figure S166: Comparison on direct component at Mariendal

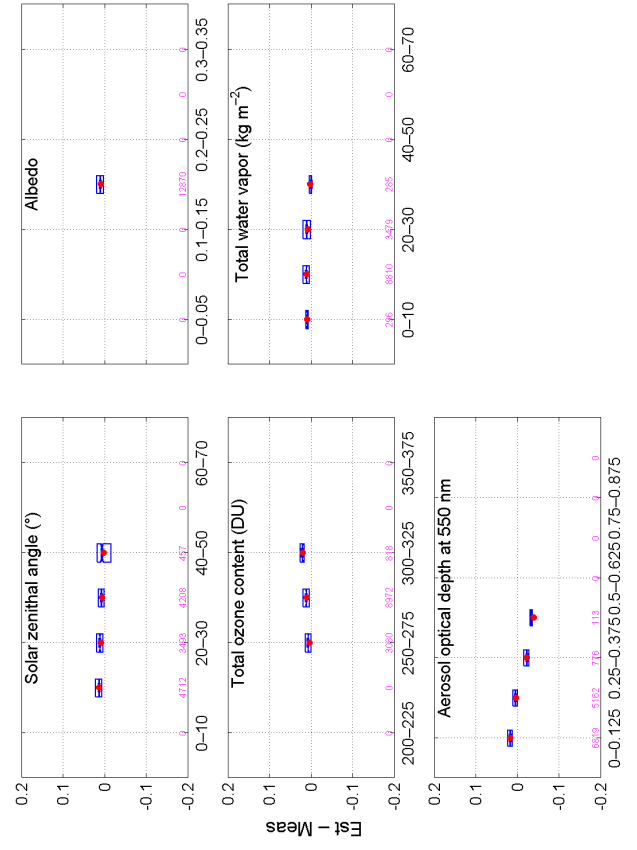
KT. Mariendal (lat: -33.85; lon: 18.82; 178 m) 2018



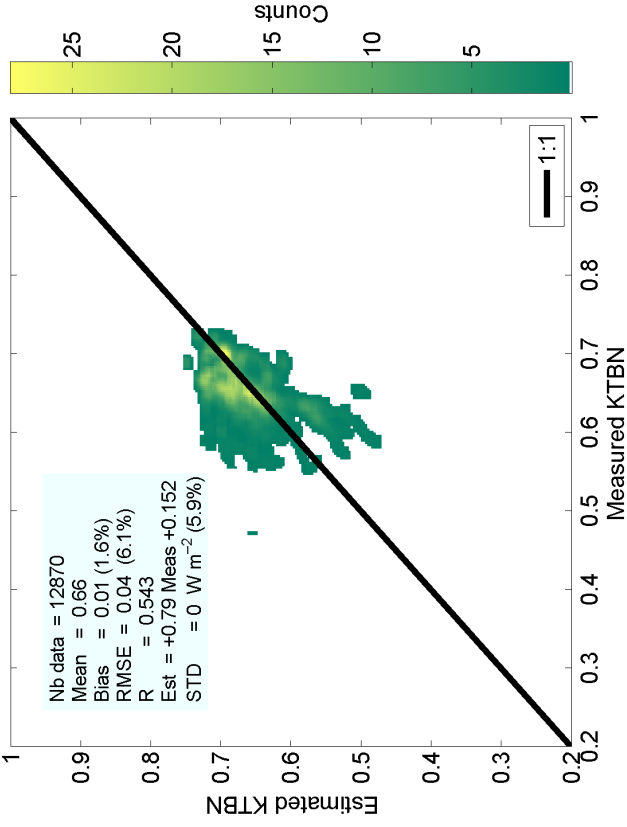
KT. Mariendal (lat: -33.85; lon: 18.82; 178 m) 2018



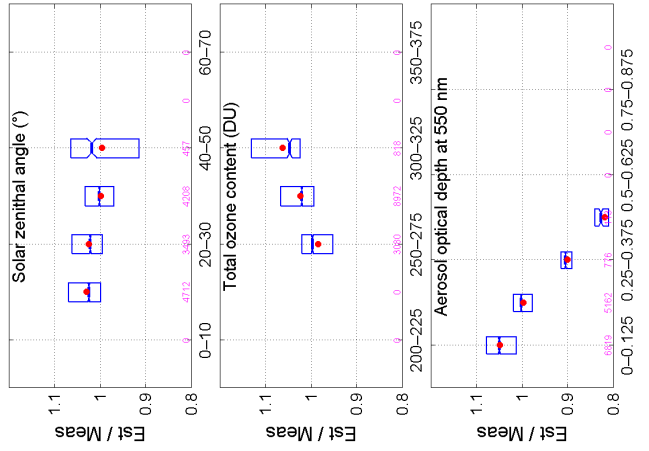
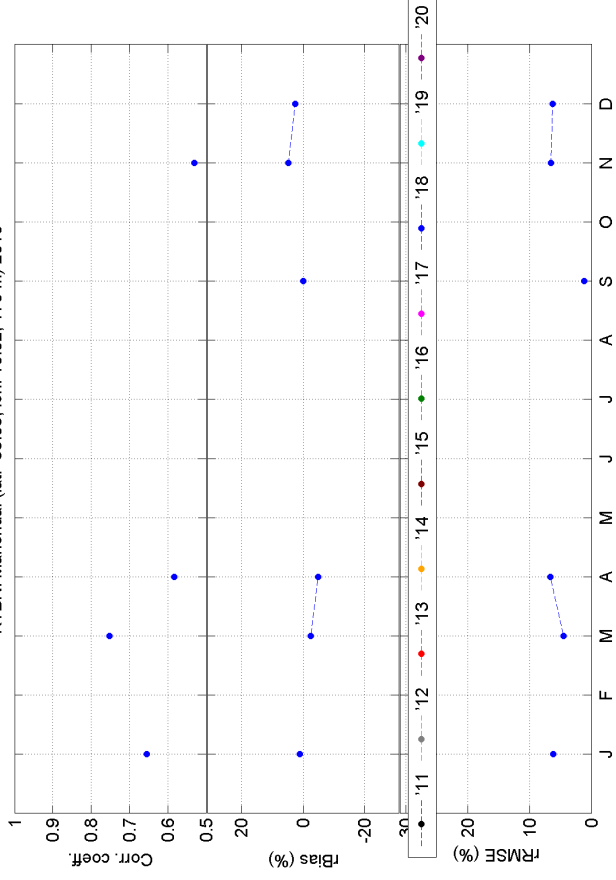
KT. Mariendal (lat: -33.85; lon: 18.82; 178 m) 2018



KTBN, Mariendal (lat: -33.85; lon: 18.82; 178 m) 2018



KTBN, Mariendal (lat: -33.85; lon: 18.82; 178 m) 2018



KTBN, Mariendal (lat: -33.85; lon: 18.82; 178 m) 2018

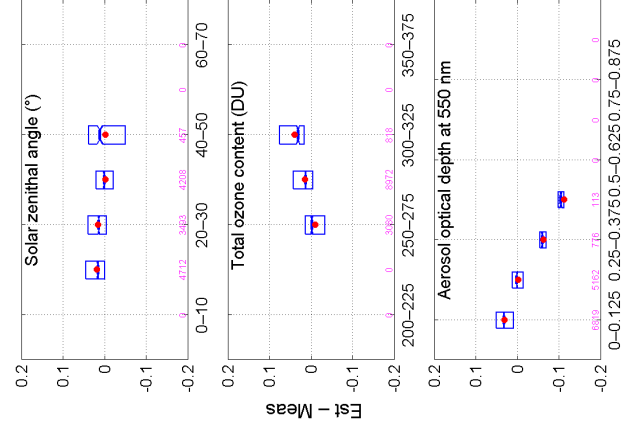


Figure S168: Comparison on direct clearness index at Mariendal

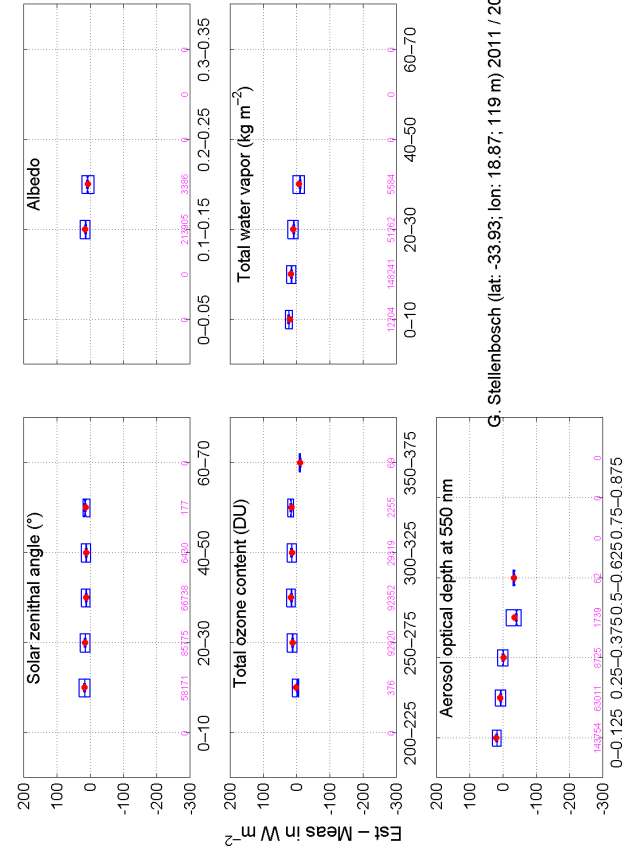
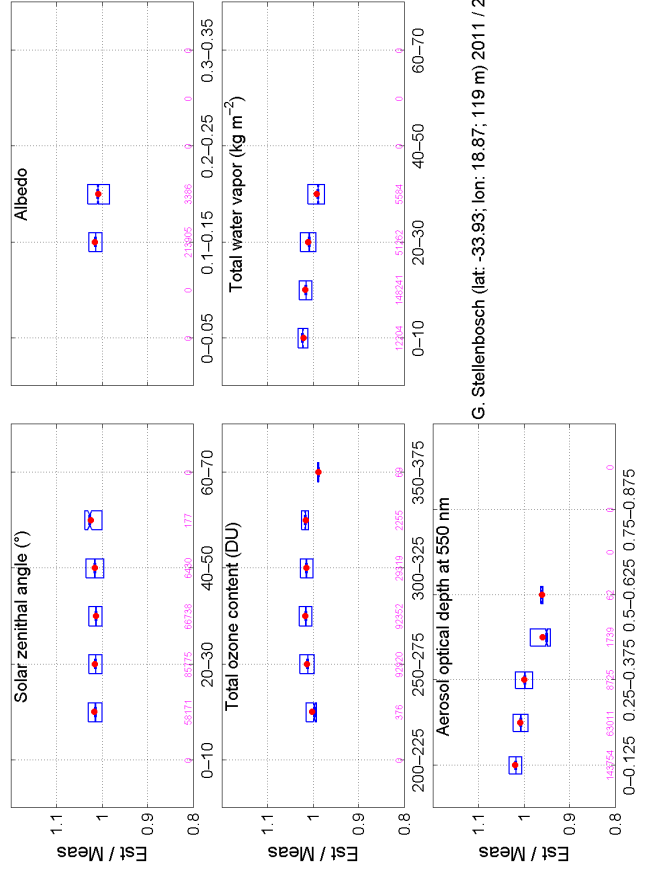
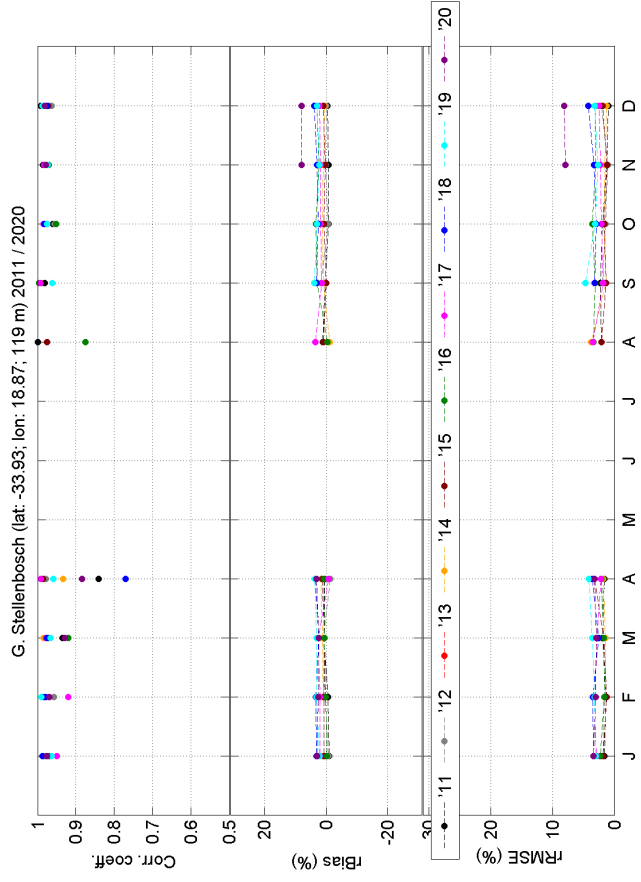
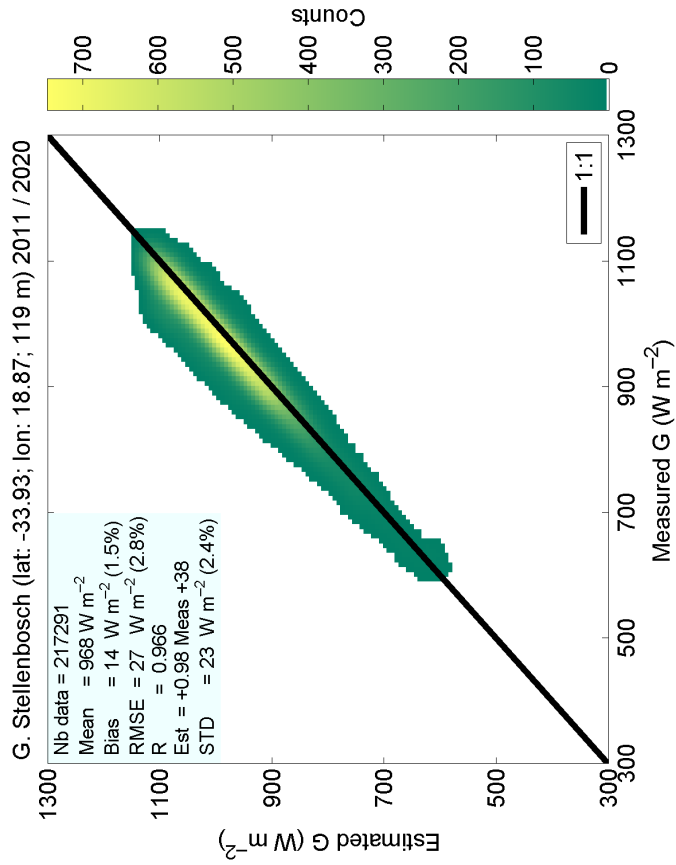


Figure S169: Comparison on global irradiance at Stellenbosch

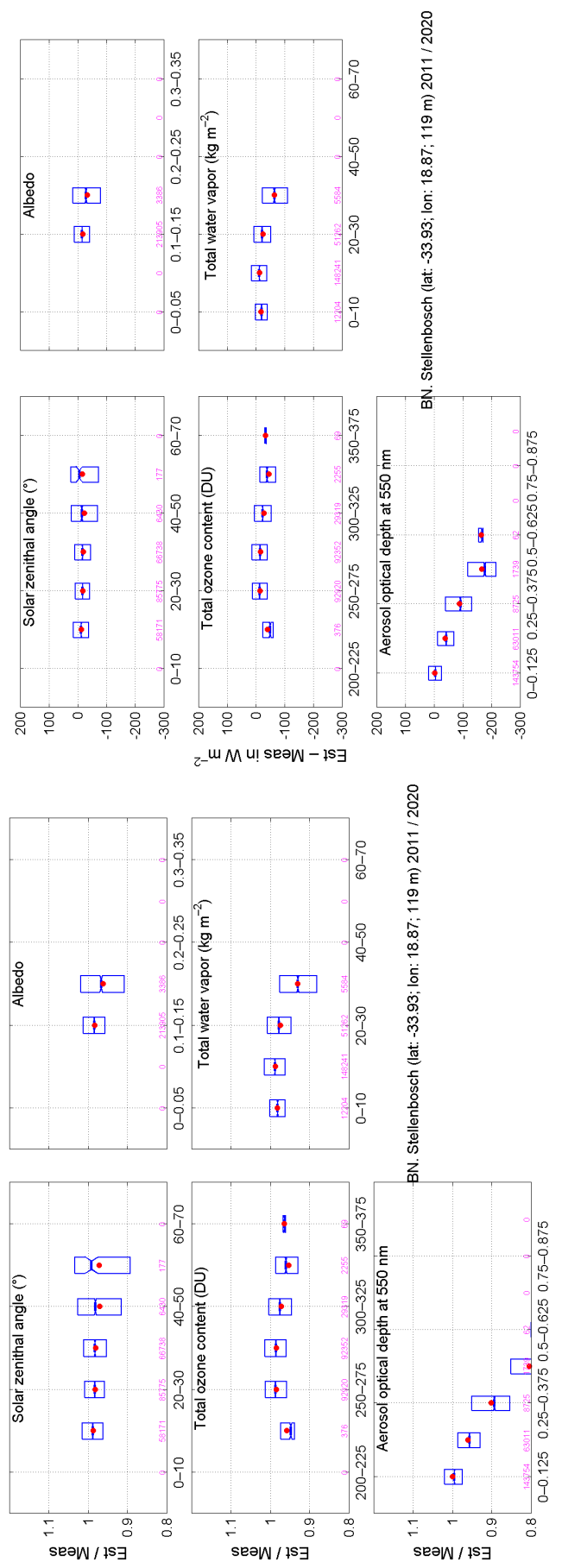
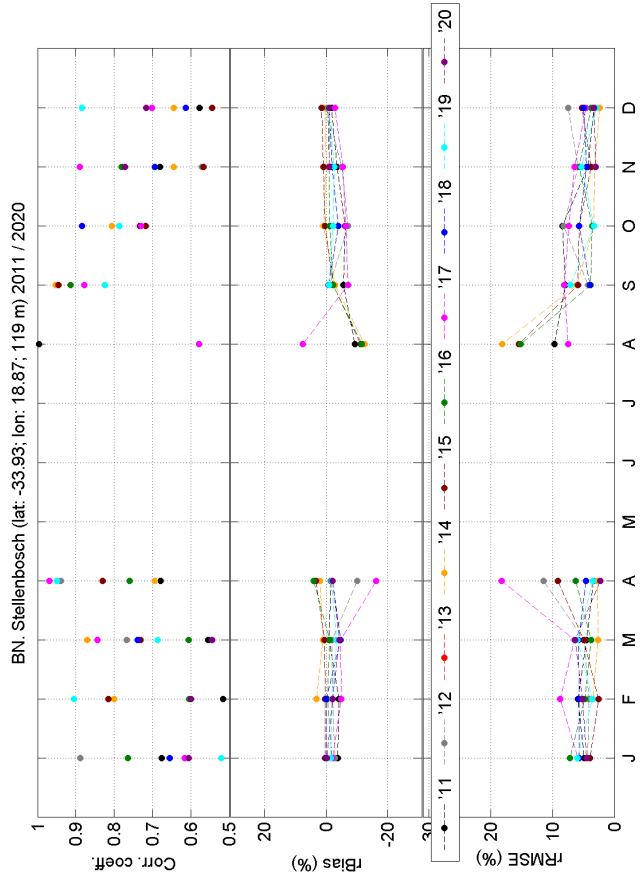
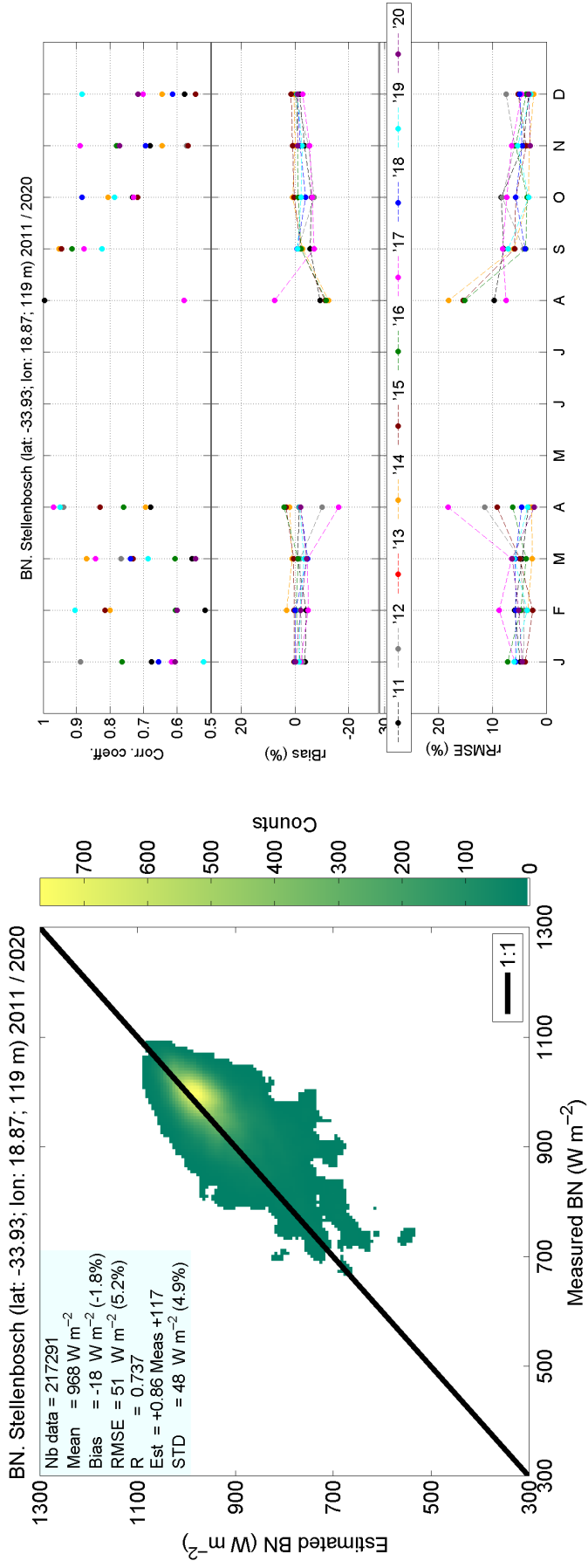


Figure S170: Comparison on direct component at Stellenbosch

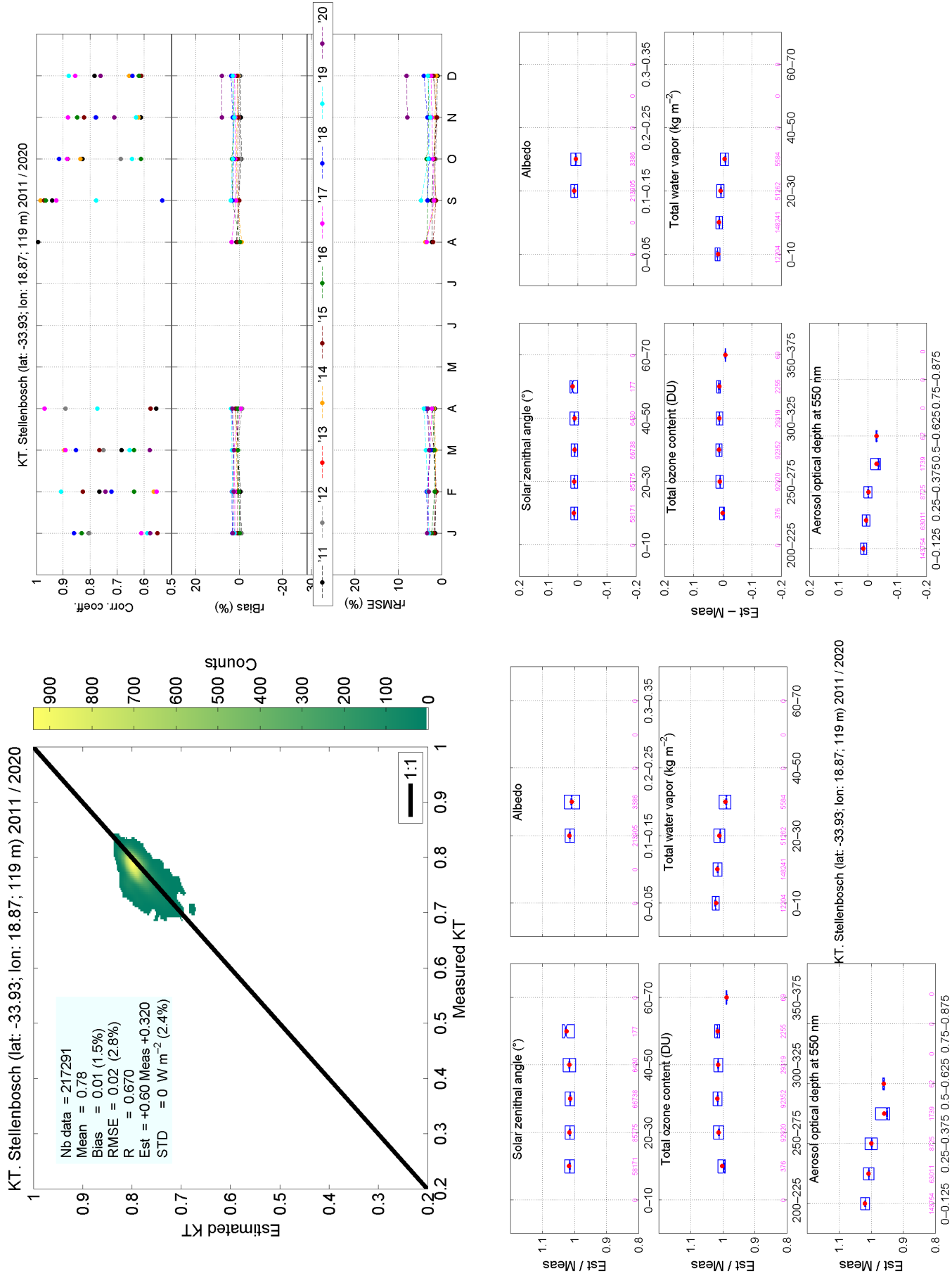


Figure S171: Comparison on clearness index at Stellenbosch

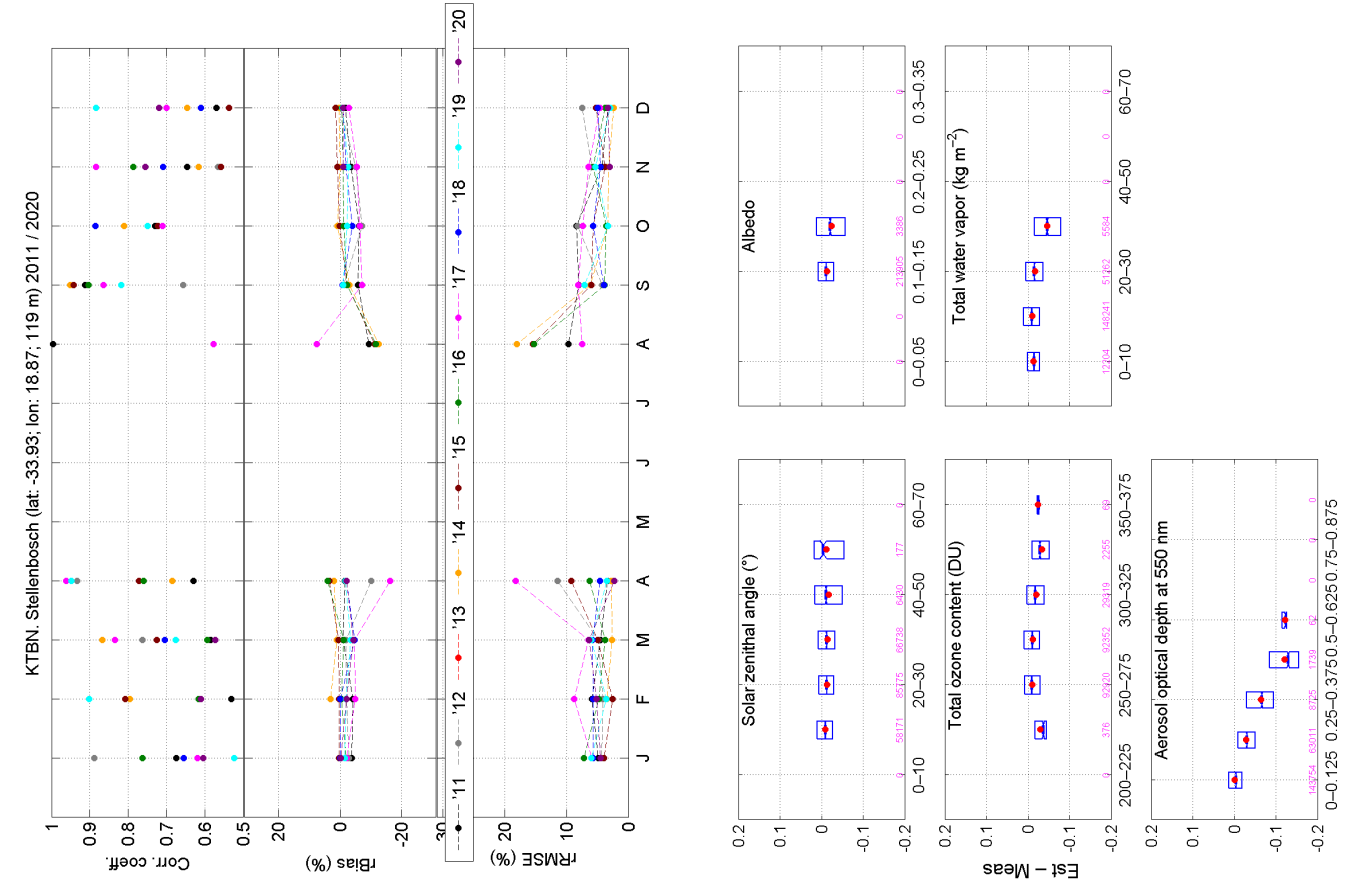


Figure S172: Comparison on direct clearness index at Stellenbosch

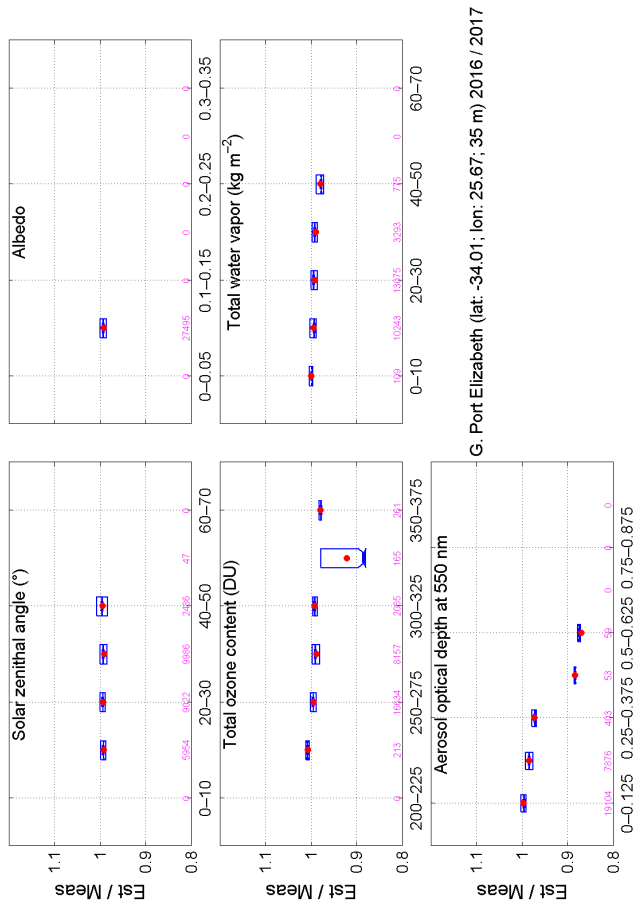
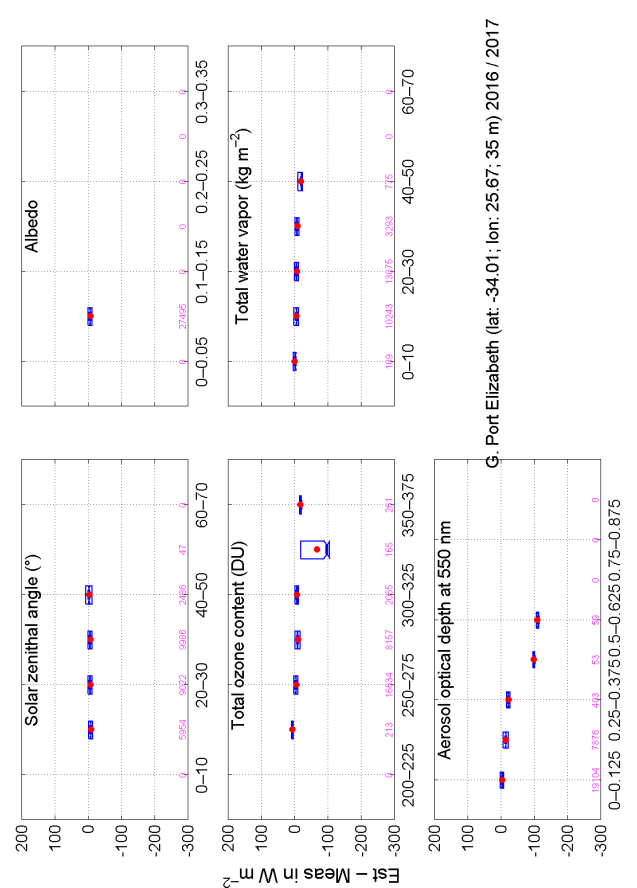
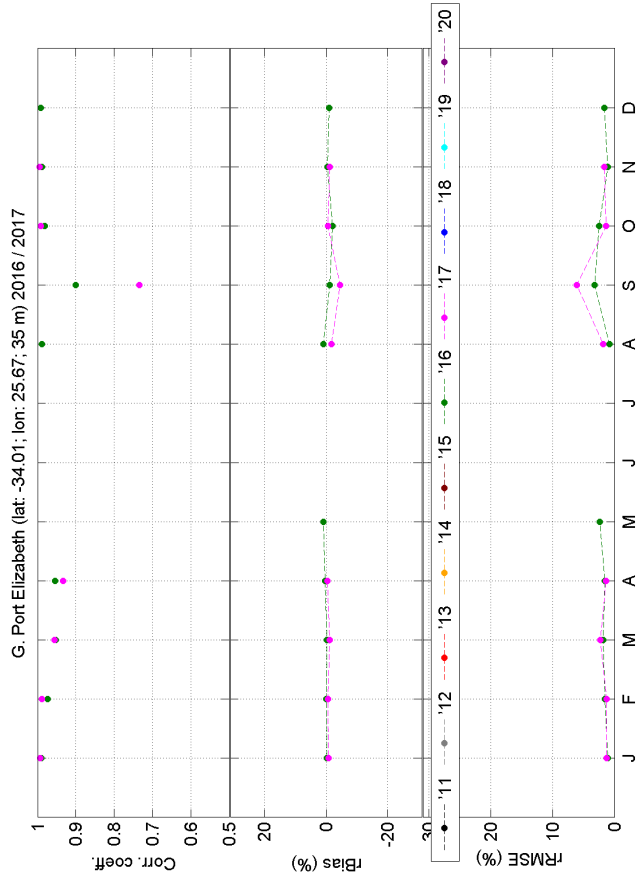
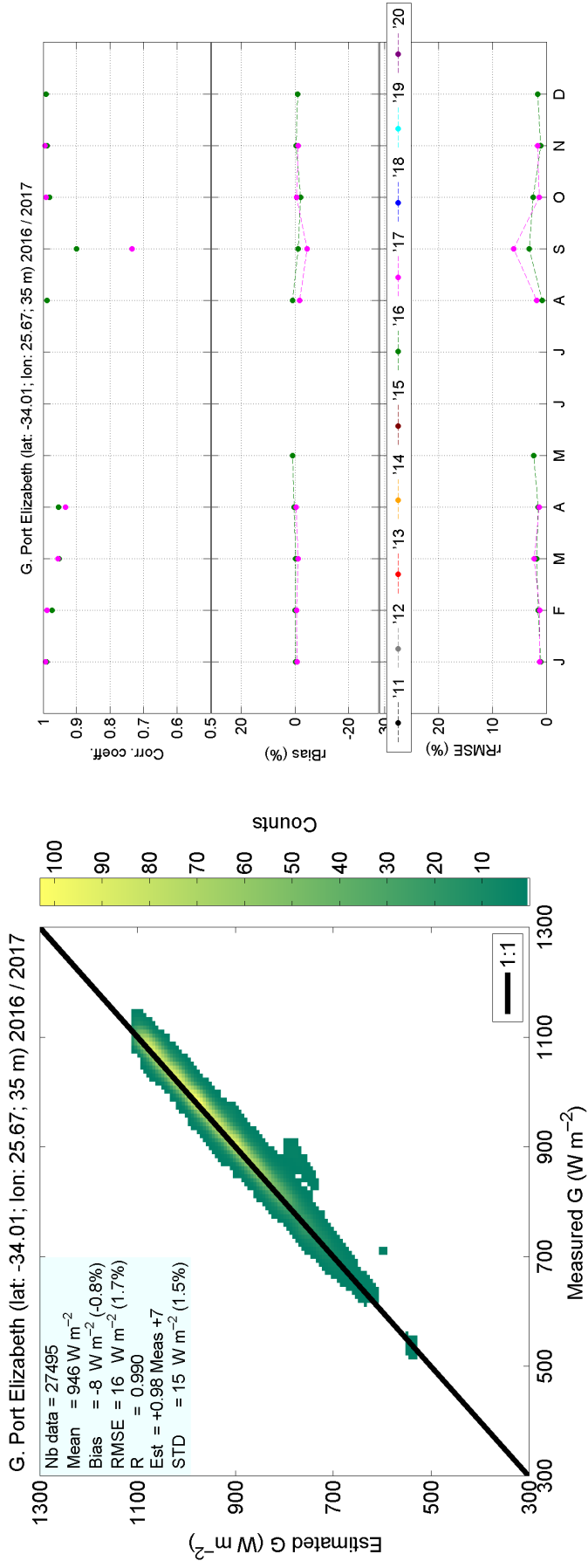


Figure S173: Comparison on global irradiance at Port Elizabeth

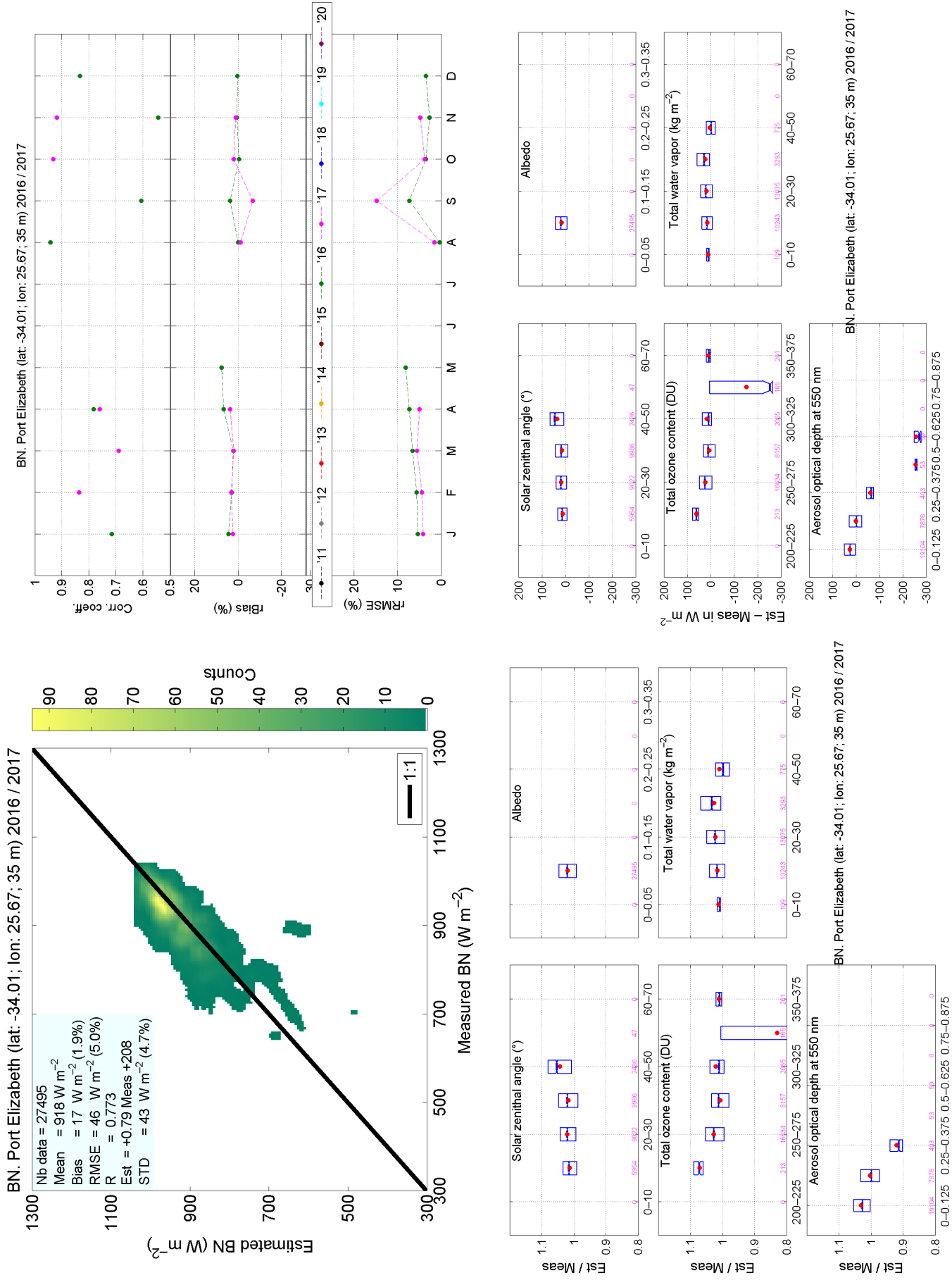


Figure S174: Comparison on direct component at normal irradiance at Port Elizabeth

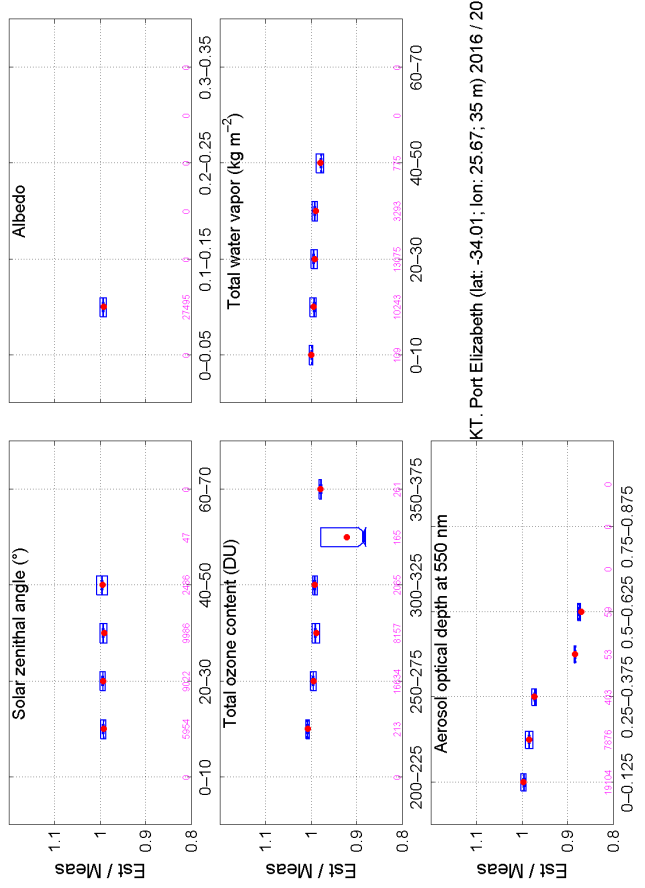
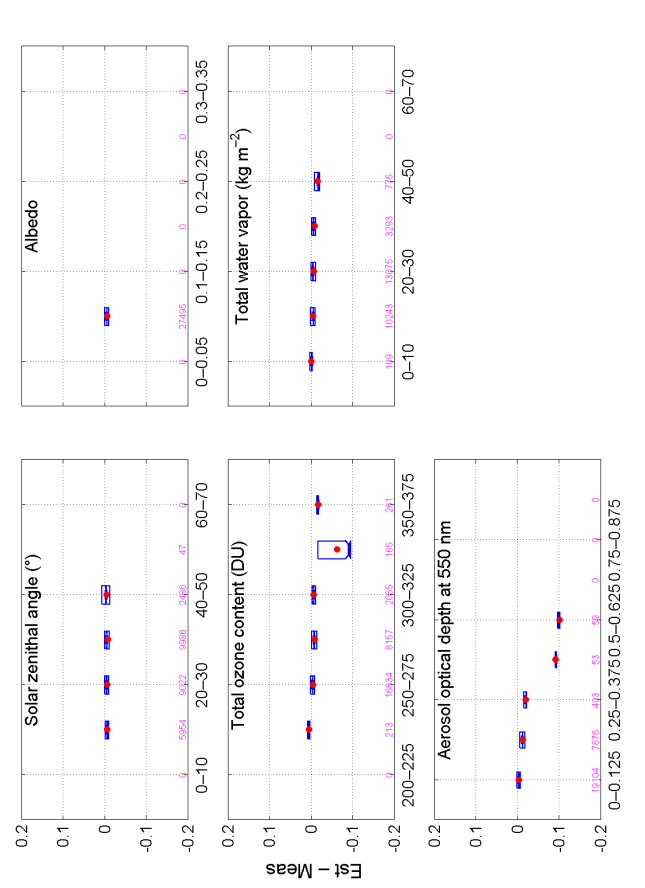
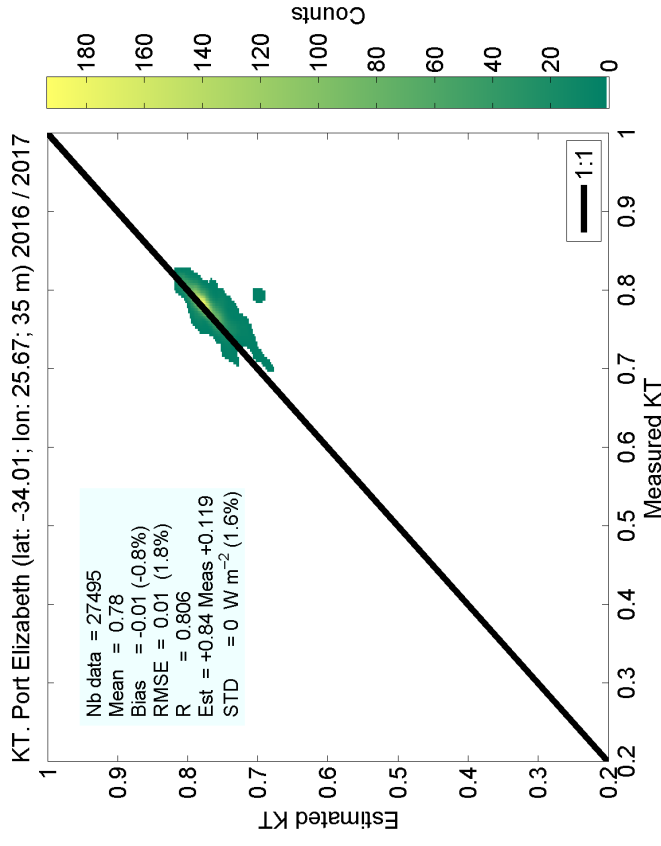
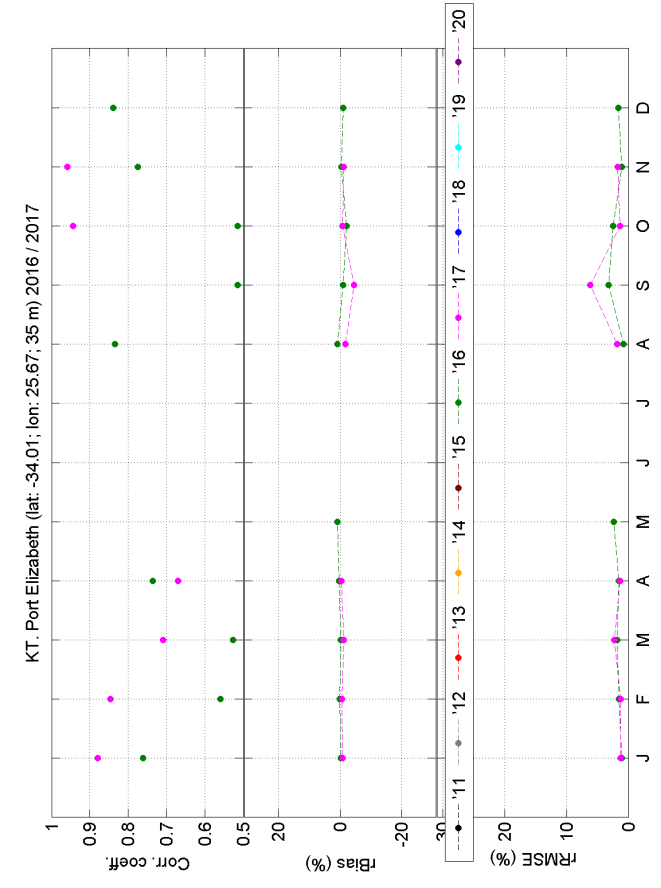


Figure S175: Comparison on clearness index at Port Elizabeth

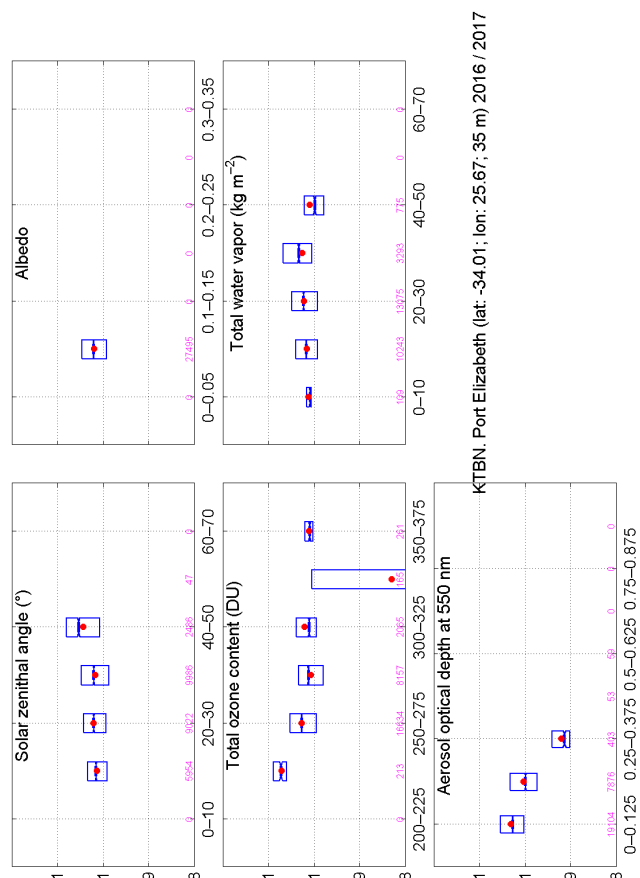
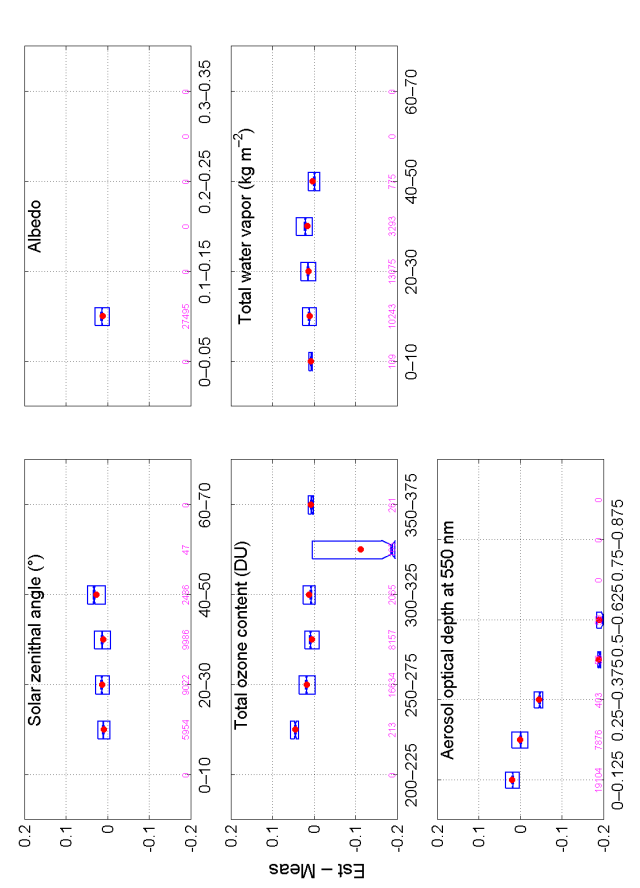
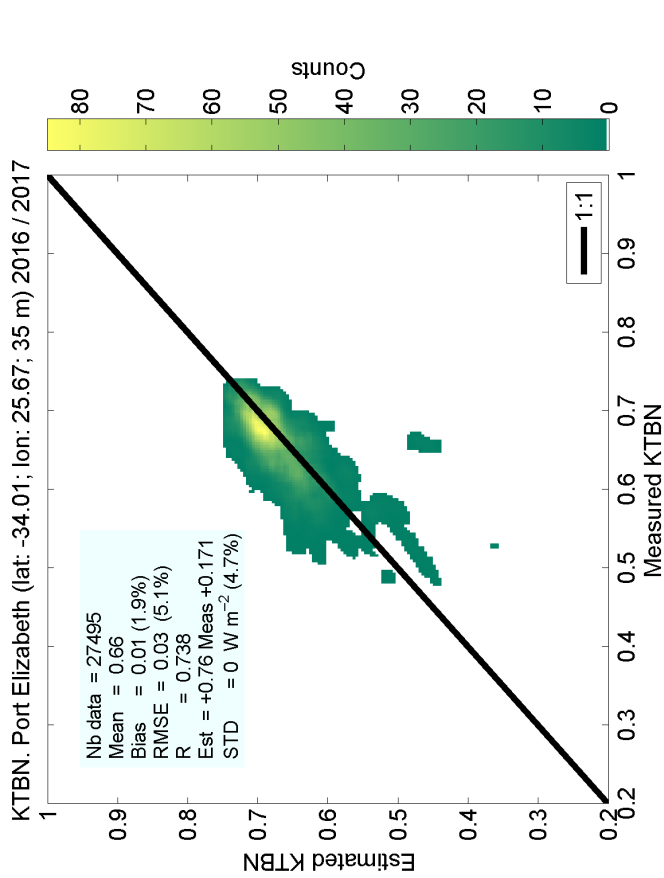
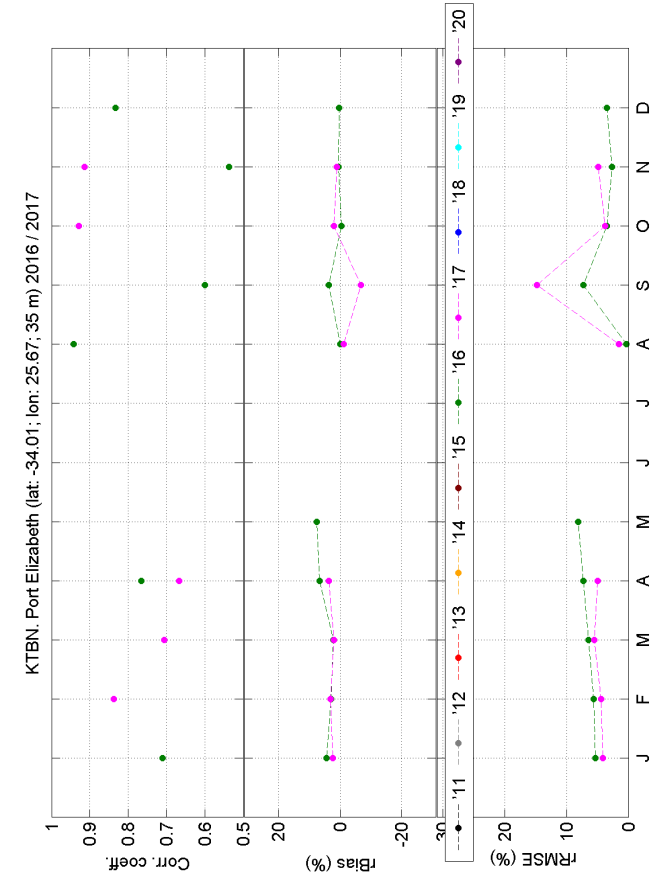


Figure S176: Comparison on direct clearness index at Port Elizabeth