



Supplement of

An assessment of lunar photometry in AERONET

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Supplement

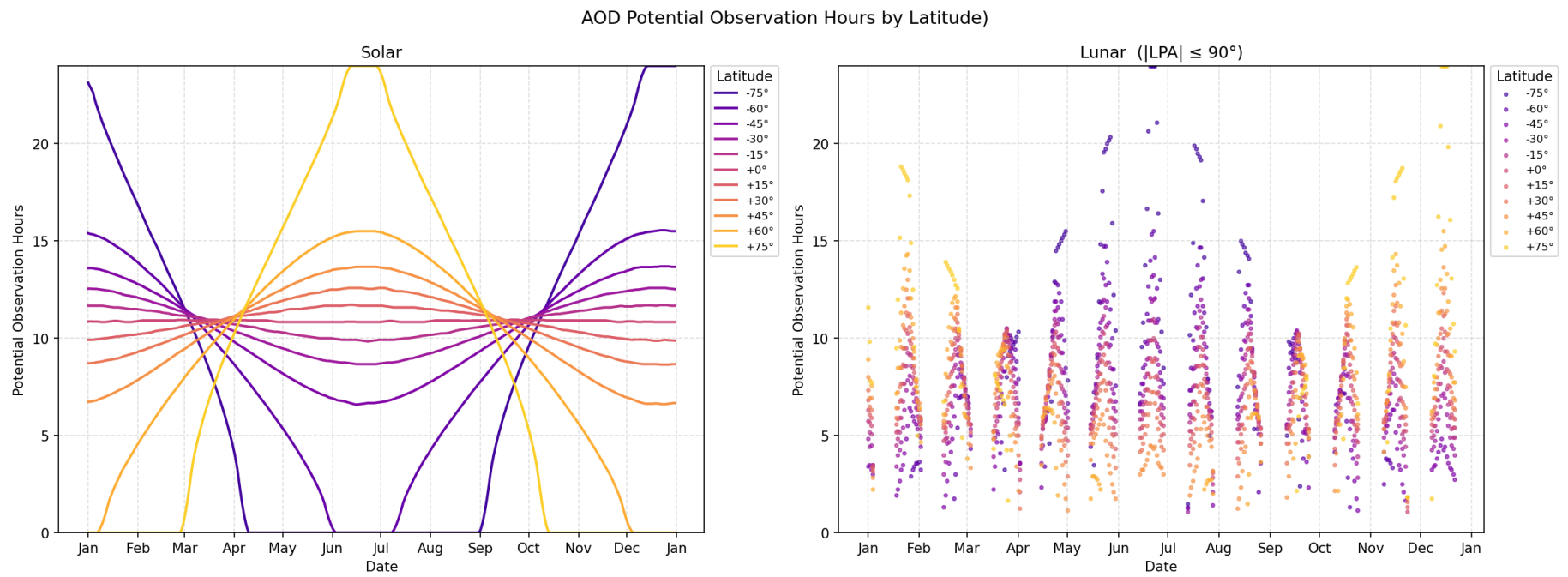


Figure S1: Caption for Figure S1.

Paired AOD scatter by comparison type

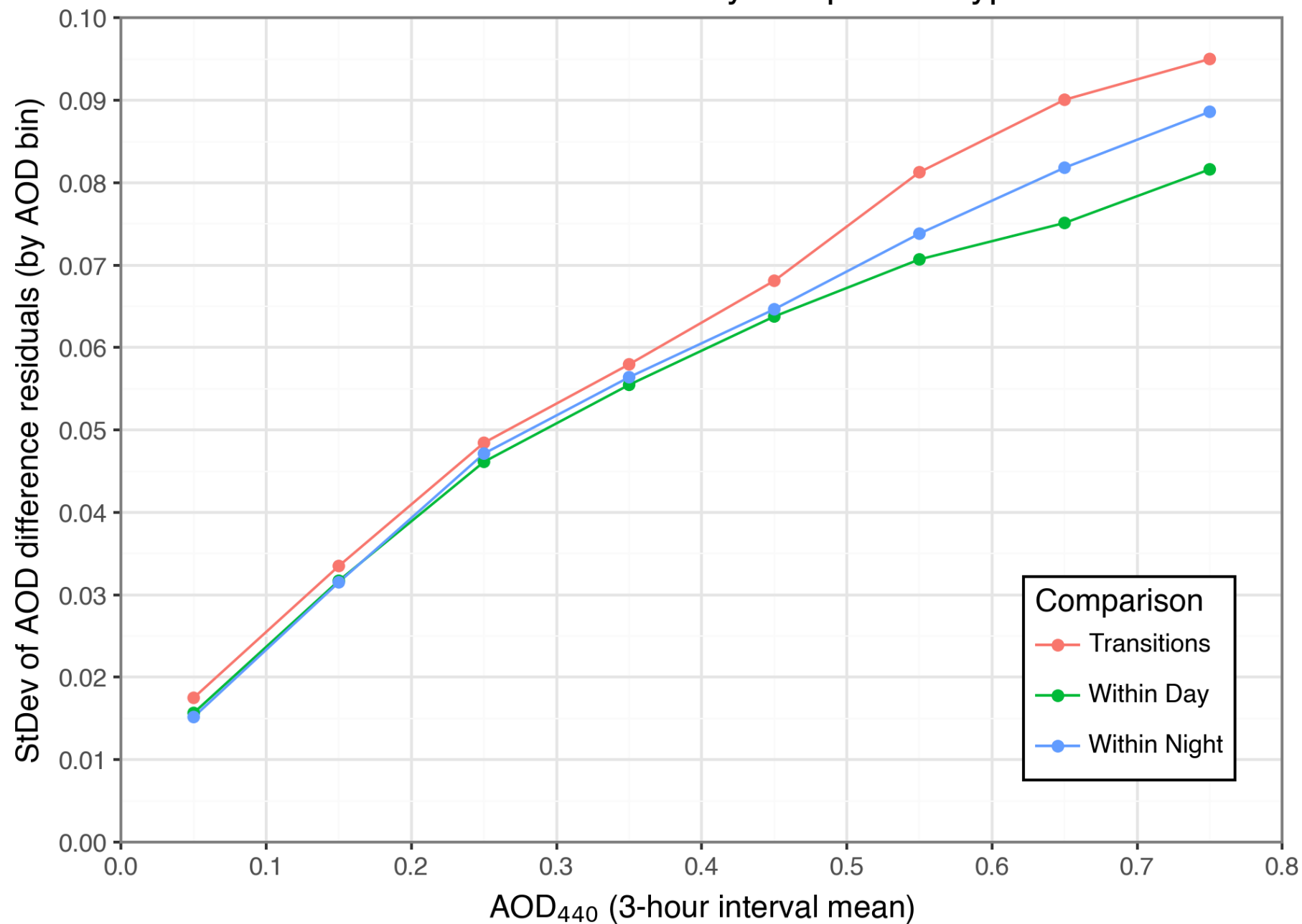


Figure S2: Caption for Figure S2.

Table S1: AOD exclusion rates (% excluded) by site, measurement type, and wavelength channel (nm).

Site	Type	$\langle \text{AOD}_{440} \rangle$	% Excluded by Channel (nm)			
			440	500	675	870
BMKG_Jakarta	Solar	0.84	2.17	1.10	0.12	0.00
BMKG_Jakarta	Lunar	0.74	5.79	1.29	0.25	0.03
Bhola	Solar	0.80	2.74	1.32	0.12	0.01
Bhola	Lunar	0.75	6.79	0.54	0.04	1.54
Dhaka_University	Solar	1.06	4.61	2.13	0.10	0.00
Dhaka_University	Lunar	0.92	5.66	0.68	0.01	0.02
GSFC	Solar	0.16	0.19	0.19	0.06	0.01
GSFC	Lunar	0.13	2.19	0.30	0.18	0.10
Gandhi_College	Solar	0.89	2.56	1.27	0.15	0.03
Gandhi_College	Lunar	0.79	6.97	1.61	0.06	0.02
Ilorin	Solar	0.78	0.82	0.02	0.01	0.01
Ilorin	Lunar	0.80	4.74	0.27	0.00	0.00
Kanpur	Solar	0.75	1.96	0.87	0.08	0.00
Kanpur	Lunar	0.65	3.83	0.39	0.04	0.01
Luang_Namtha	Solar	0.71	2.70	1.72	0.35	0.01
Luang_Namtha	Lunar	0.58	7.00	2.37	0.10	0.26
Mongu_Inn	Solar	0.36	0.39	0.11	0.03	0.01
Mongu_Inn	Lunar	0.39	1.88	0.08	0.01	0.01
Monterey	Solar	0.12	0.30	0.25	0.91	0.02
Monterey	Lunar	0.09	1.44	0.16	0.04	0.10
NGHIA_DO	Solar	0.96	3.56	1.89	0.39	0.00
NGHIA_DO	Lunar	0.85	6.65	1.76	1.04	0.60
NREL-Golden	Solar	0.11	0.09	0.08	0.02	0.01
NREL-Golden	Lunar	0.08	2.86	0.49	0.08	0.07
Palangkaraya	Solar	0.58	7.02	5.88	2.06	0.04
Palangkaraya	Lunar	0.49	8.08	3.02	0.29	0.14
Singapore	Solar	0.49	3.69	1.11	0.33	0.04
Singapore	Lunar	0.38	7.63	1.73	0.16	0.02
Valladolid	Solar	0.12	0.06	0.09	0.04	0.02
Valladolid	Lunar	0.11	0.44	0.10	0.04	0.05
Yonsei_University	Solar	0.37	0.54	0.24	0.03	0.01
Yonsei_University	Lunar	0.31	2.63	0.55	0.10	0.01

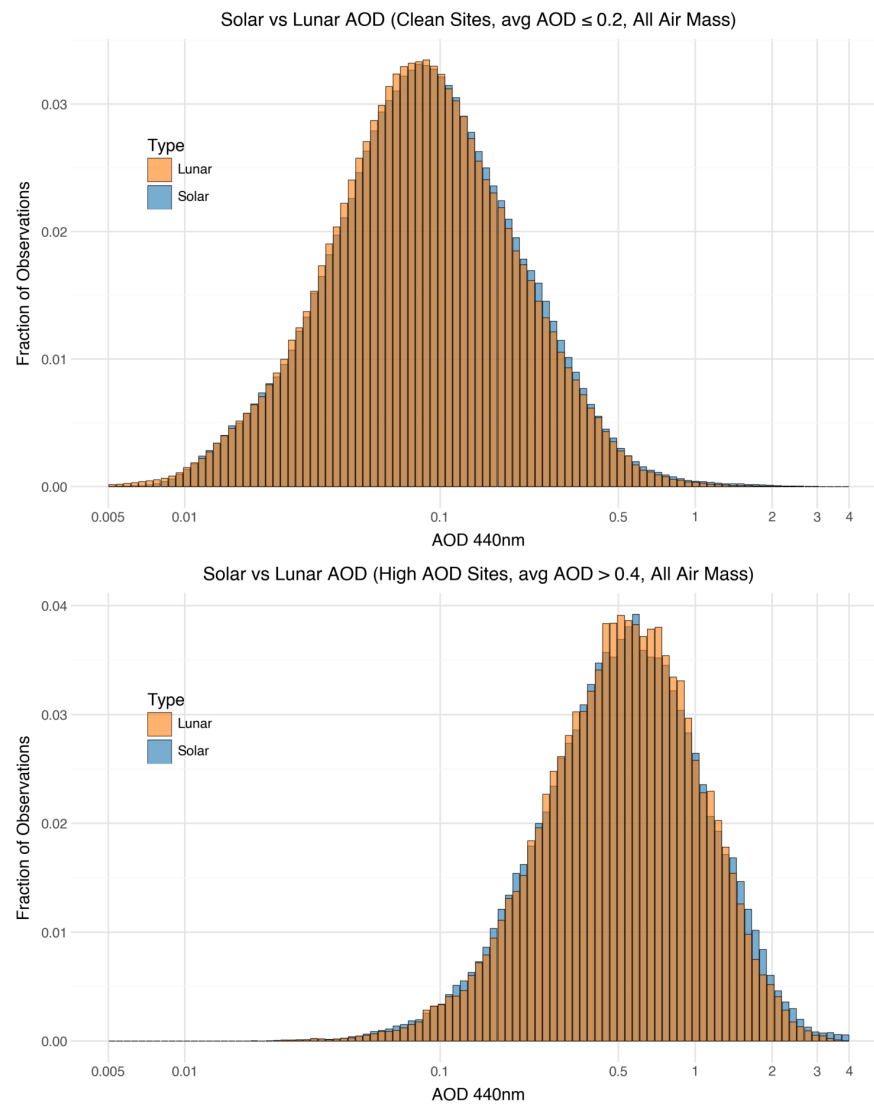


Figure S3: Caption for Figure S3.

Table S2: Langley pair quality thresholds by channel.

Channel (nm)	max AOD	δ AOD	C.C.
440	0.04	0.002	0.95
500	0.03	0.002	0.95
675	0.02	0.001	0.95
870	0.01	0.001	0.95
1020	0.01	0.001	0.95
1640	0.015	0.001	0.99

Lunar Triplet Variability by Phase Angle (675nm)

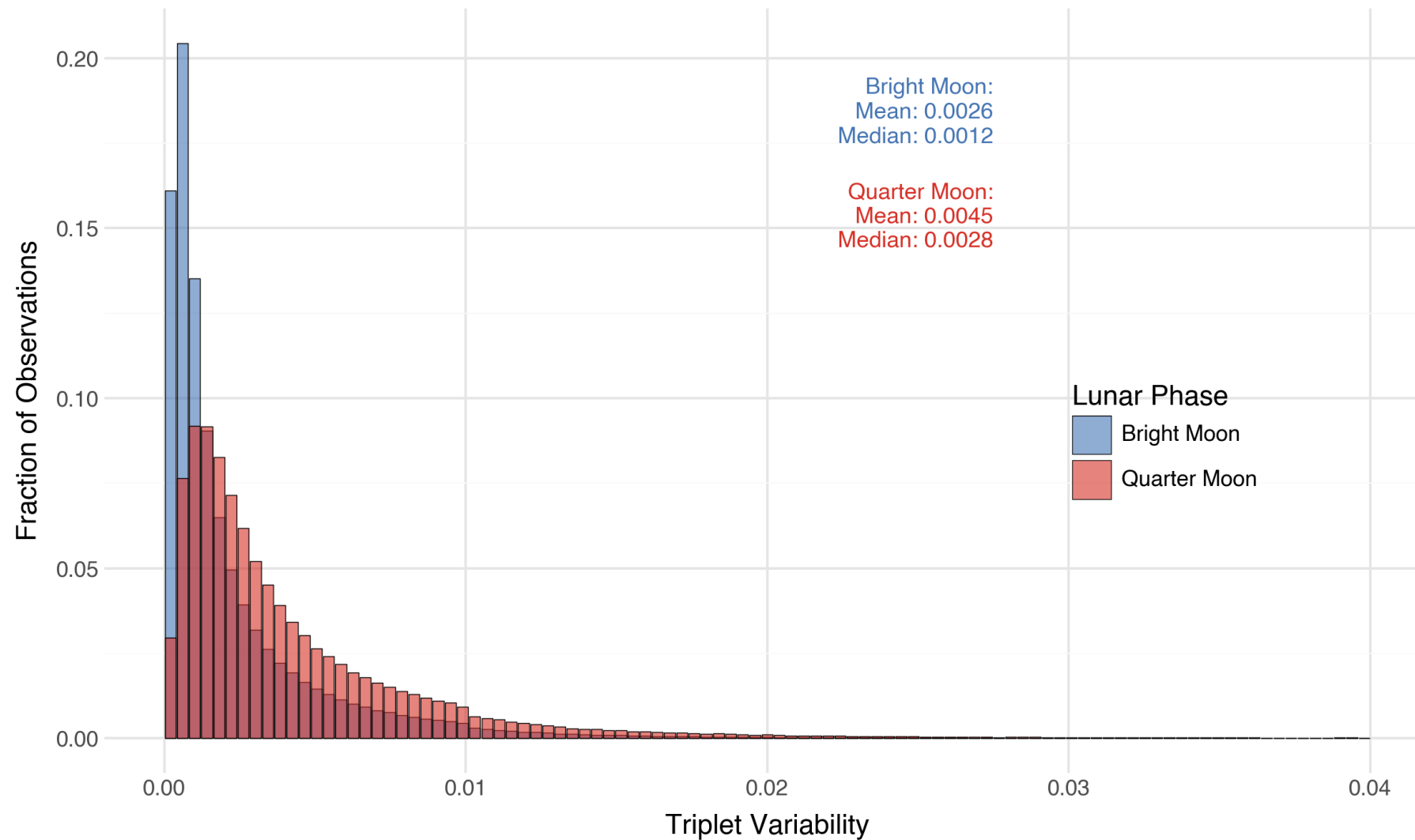


Figure S4: Caption for Figure S2.

Table S3: Mean AOD differences and sample sizes (N) by lunar phase angle (LPA) bin and wavelength channel.

LPA bin ($^{\circ}$)	440 nm		500 nm		675 nm		870 nm		1020 nm		1640 nm	
	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N
$(-90, -80]$	-0.0019	7650	-0.0001	8104	0.0043	8324	0.0022	8358	0.0004	8177	0.0007	5812
$(-80, -70]$	-0.0007	10117	0.0004	10633	0.0026	10956	0.0006	10961	-0.0013	10683	0.0010	10172
$(-70, -60]$	-0.0014	11633	0.0004	12108	0.0025	12403	0.0002	12358	-0.0015	12234	0.0002	11466
$(-60, -50]$	-0.0016	11973	-0.0001	12403	0.0023	12429	0.0005	12427	-0.0008	12320	0.0005	11549
$(-50, -40]$	-0.0020	13087	-0.0016	13368	0.0014	13528	0.0002	13552	-0.0015	13428	0.0003	12636
$(-40, -30]$	-0.0009	12990	-0.0006	13172	0.0018	13297	0.0008	13266	-0.0007	13253	0.0009	12330
$(-30, -20]$	-0.0013	13645	-0.0006	13815	0.0010	13901	0.0002	13873	-0.0008	13757	0.0004	13075
$(-20, -10]$	-0.0005	18416	-0.0002	18500	0.0004	18651	0.0003	18605	-0.0001	18472	0.0002	17457
$(-10, 0]$	0.0006	20707	0.0008	20787	0.0004	20933	0.0005	20932	0.0005	20702	0.0006	19782
$(0, +10]$	0.0004	22668	0.0002	22677	-0.0004	22842	-0.0002	22853	0.0003	22586	0.0003	21403
$(+10, +20]$	0.0011	20739	0.0013	20819	-0.0012	21036	-0.0001	21018	0.0010	20764	0.0003	19718
$(+20, +30]$	0.0017	15949	0.0020	16180	-0.0015	16312	0.0003	16288	0.0019	16029	0.0005	15518
$(+30, +40]$	0.0020	15489	0.0011	15777	-0.0018	15990	0.0003	15949	0.0022	15757	-0.0001	14892
$(+40, +50]$	0.0042	15492	0.0013	15825	-0.0016	16074	-0.0006	16032	0.0026	15729	0.0007	15155
$(+50, +60]$	0.0000	13994	0.0002	14587	-0.0017	14764	-0.0012	14811	0.0014	14489	-0.0005	13891
$(+60, +70]$	-0.0002	13058	0.0000	13842	-0.0016	14161	-0.0002	14162	0.0008	13761	-0.0008	13353
$(+70, +80]$	0.0045	11522	0.0037	12110	-0.0006	12391	0.0016	12403	0.0017	12060	0.0003	11849
$(+80, +90]$	0.0072	6933	0.0059	7307	-0.0008	7463	0.0025	7455	0.0025	7230	-0.0001	5809

Table S4: Average standard deviation of AOD differences by AOD bin and measurement group.

AOD bin	Transition	Within-day	Within-night
0.0–0.1	0.018	0.016	0.015
0.1–0.2	0.034	0.032	0.032
0.2–0.3	0.048	0.046	0.047
0.3–0.4	0.058	0.056	0.056
0.4–0.5	0.068	0.064	0.065
0.5–0.6	0.081	0.071	0.074
0.6–0.7	0.091	0.075	0.082
0.7–0.8	0.096	0.080	0.086

Table S5: Mean and standard deviation of AOD differences by latitude bin.

Latitude bin (°)	Mean difference	Standard deviation	N
(+60, +70]	-0.0009	0.0143	365
(+50, +60]	0.0023	0.0148	2645
(+40, +50]	0.0003	0.0122	51714
(+30, +40]	0.0004	0.0121	83253
(+20, +30]	0.0022	0.0106	40667
(+10, +20]	0.0009	0.0084	15624
(0, +10]	-0.0006	0.0116	733
(−10, 0]	-0.0021	0.0122	2368
(−20, −10]	-0.0009	0.0126	13360
(−30, −20]	-0.0004	0.0111	37479
(−40, −30]	0.0011	0.0135	11440

Data Sets

Data Set S1. ROLO bias correction lookup table values by wavelength and lunar phase angle. File: `ROLO_Bias_Correction_Vals`.