Supplementary figures

Examples of ABL height identification for all DH2 flights used in the current study and the corresponding radiosonde profiles. For all panels, the legends refer to the horizontal lines in that panel. **(Panel 1)** θ_v profile from the DH2. The stability regime is written and the subjective ABL height is written and marked with a dashed black line. The ABL height identified by each objective method is written and marked with a solid line of color associated with the legends in the last two panels. **(Panel 2)** θ_v profile from the radiosonde. The subjective ABL height is marked with a dashed black line. The ABL height identified by each objective method is written and marked with a dashed line of color associated with the legends in the last two panels. **(Panel 3)** wind speed profiles from the DH2 (solid) and radiosonde (dashed) with the location of the low-level jet identified in the DH2 profile marked with a solid horizontal line, and the location of the low-level jet identified in the radiosonde profile marked with a dashed horizontal line. **(Panel 4)** Ri_b profiles from the DH2 (solid dark purple) and the radiosonde (dashed light purple). The ABL heights identified by the Ri_b method using critical values of 0.5 and 0.75 are marked with solid horizontal lines for the DH2 profile and dashed horizontal lines for the radiosonde profile. **(Panel 5)** $d\theta_v/dz$ profiles from the DH2 (solid dark green) and the radiosonde (dashed light green). The ABL heights identified by the Heffter, Liu-Liang, and TGRDM methods are marked with solid horizontal lines for the DH2 profile and dashed horizontal lines for the radiosonde profile.
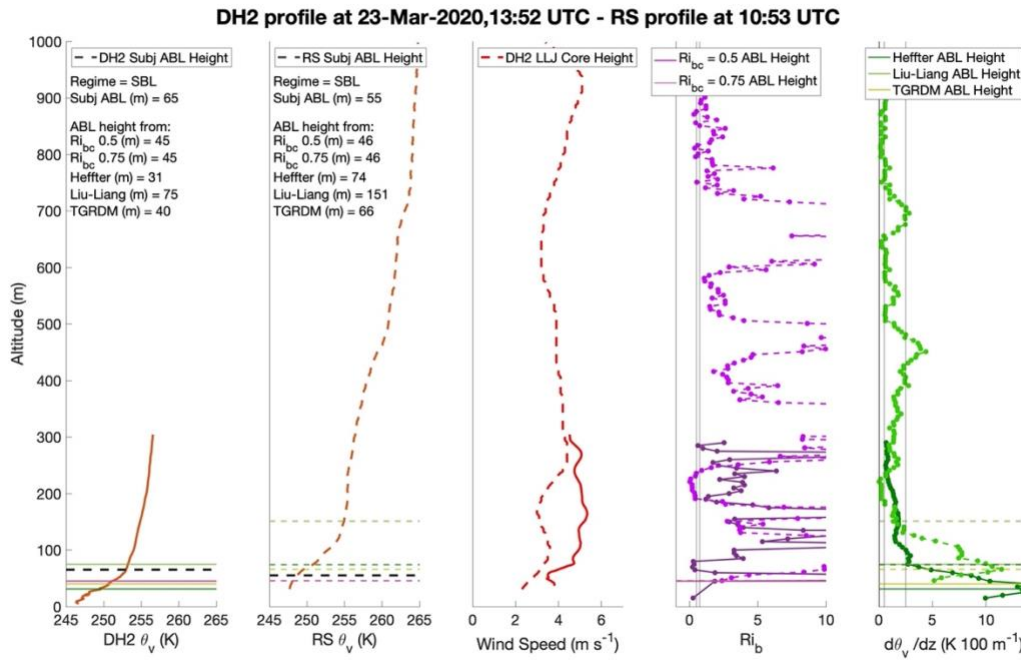
Figure S1: ABL height identification for DH2 flight on 23 March at 13:52 UTC and radiosonde profile at 10:53 UTC.
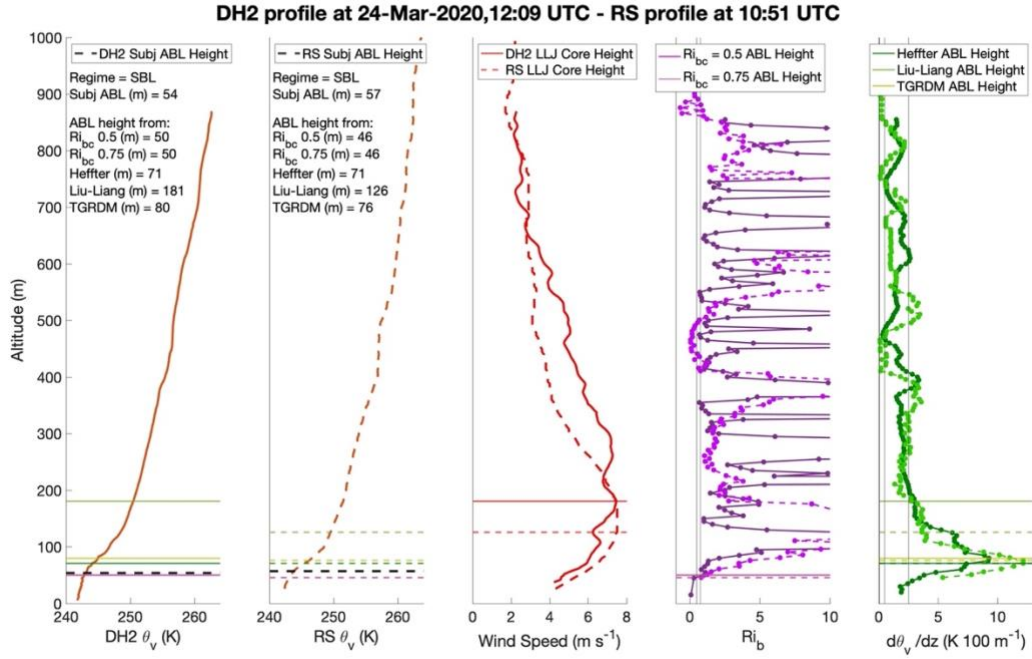
Figure S2: ABL height identification for DH2 flight on 24 March at 12:09 UTC and radiosonde profile at 10:51 UTC.
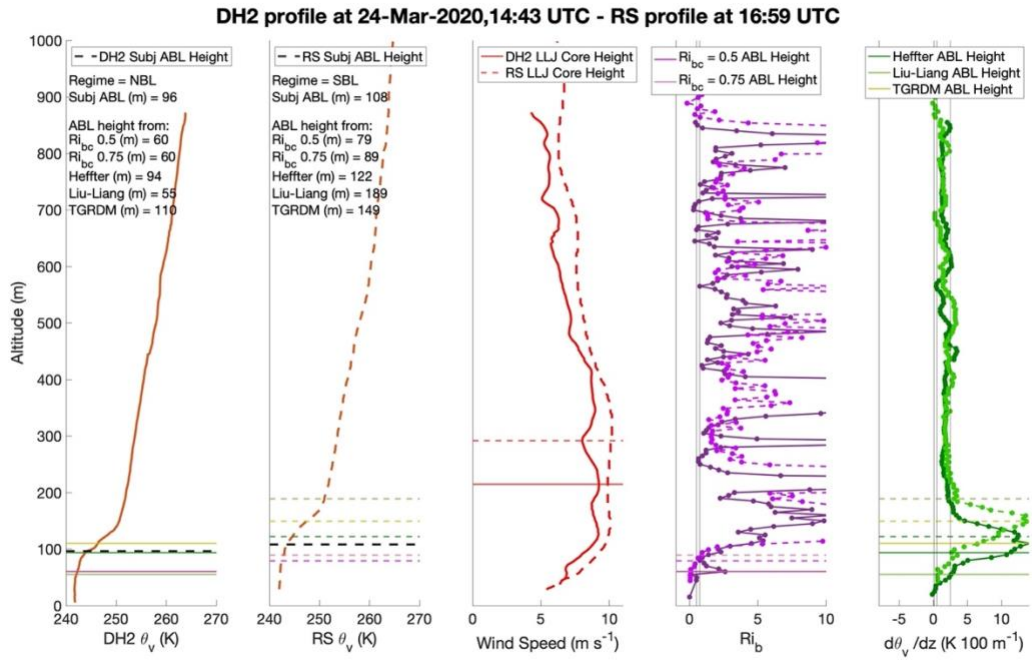
Figure S3: ABL height identification for DH2 flight on 24 March at 14:43 UTC and radiosonde profile at 16:59 UTC.
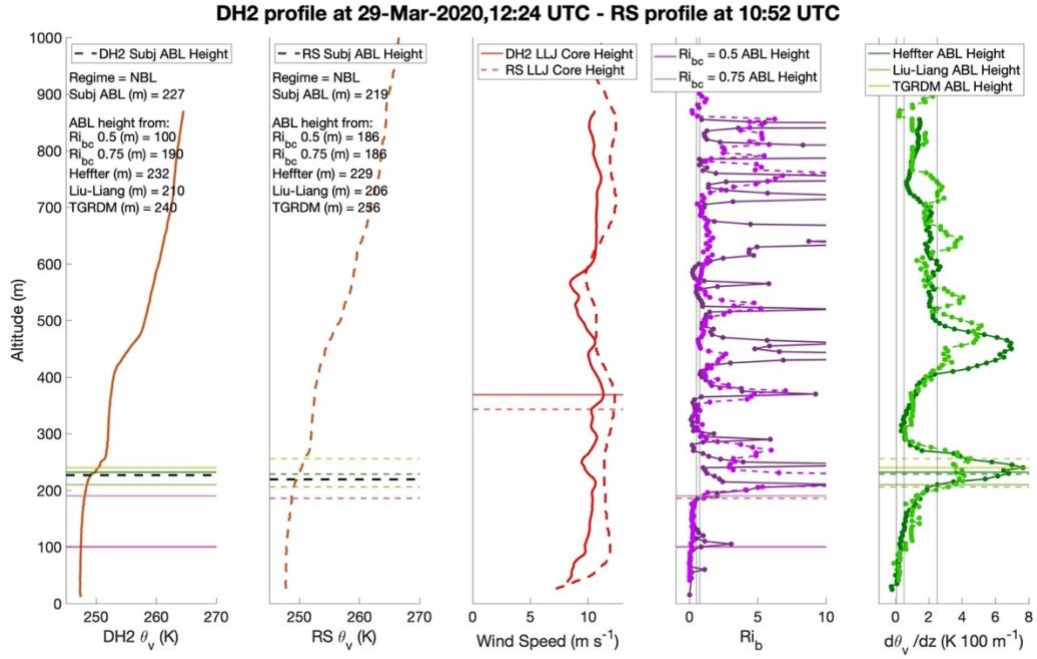
Figure S4: ABL height identification for DH2 flight on 29 March at 12:24 UTC and radiosonde profile at 10:52 UTC.
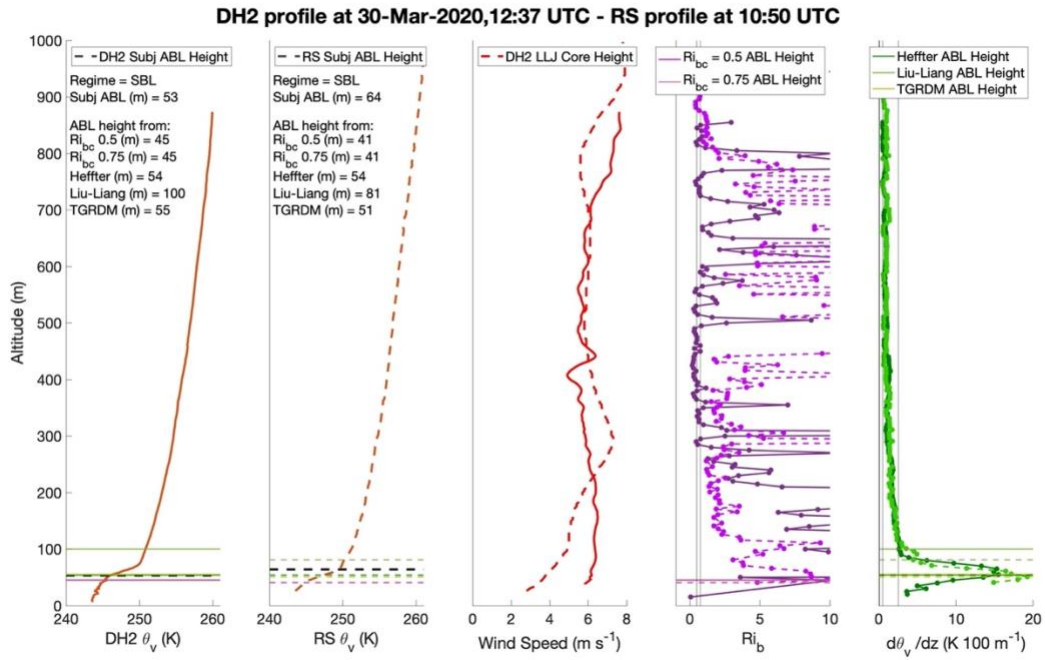
Figure S5: ABL height identification for DH2 flight on 30 March at 12:37 UTC and radiosonde profile at 10:50 UTC.
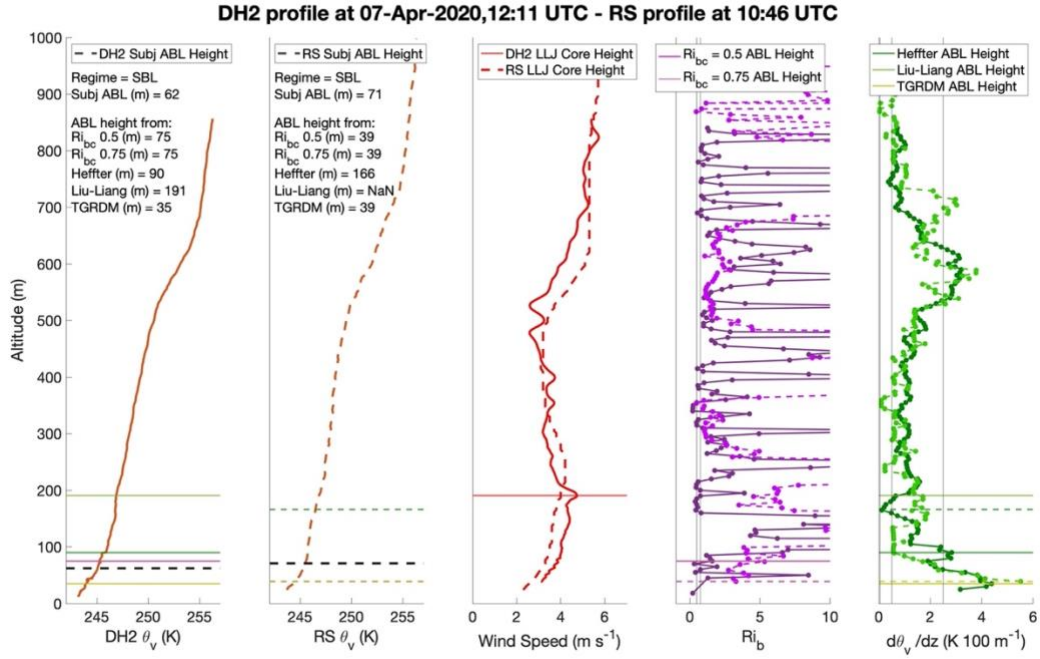
Figure S6: ABL height identification for DH2 flight on 7 April at 12:11 UTC and radiosonde profile at 10:46 UTC.
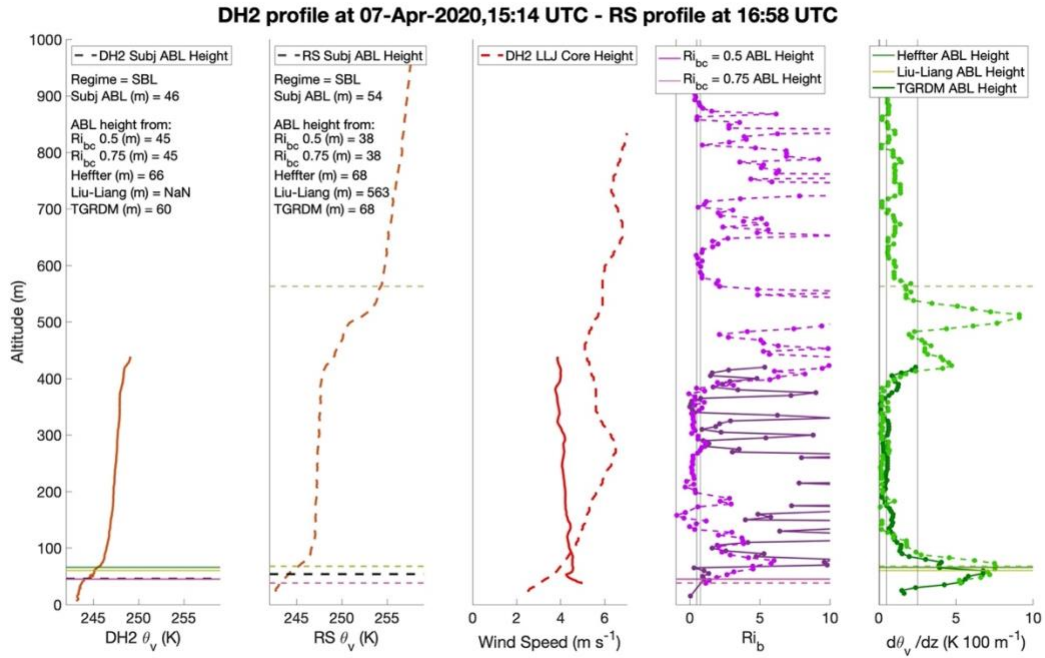
Figure S7: ABL height identification for DH2 flight on 7 April at 15:14 UTC and radiosonde profile at 16:58 UTC.
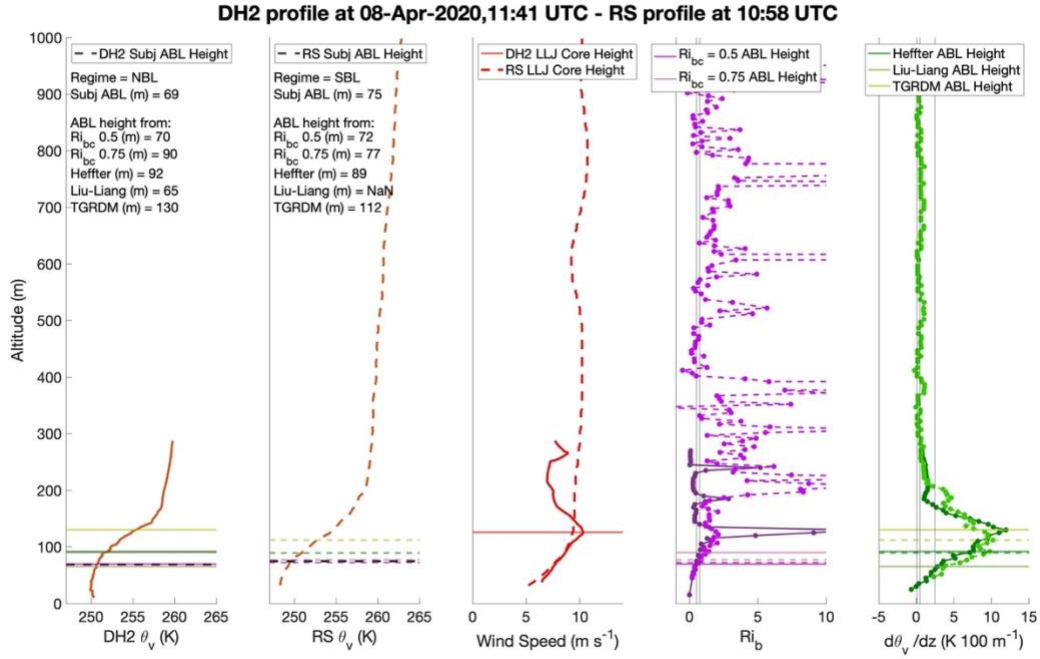
Figure S8: ABL height identification for DH2 flight on 8 April at 11:41 UTC and radiosonde profile at 10:58 UTC.
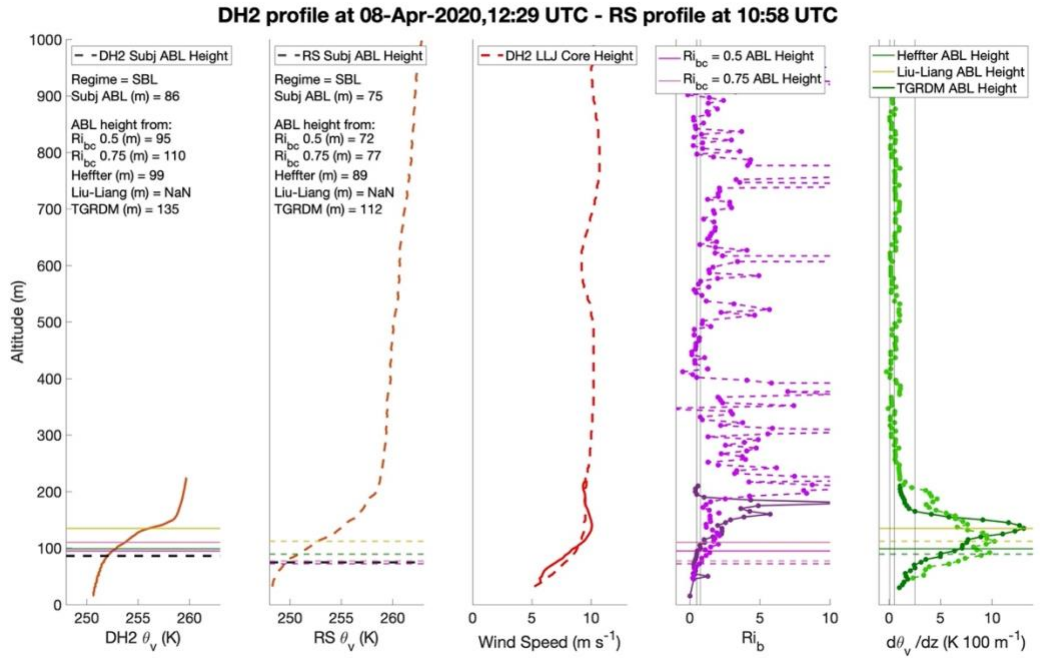
Figure S9: ABL height identification for DH2 flight on 8 April at 12:29 UTC and radiosonde profile at 10:58 UTC.
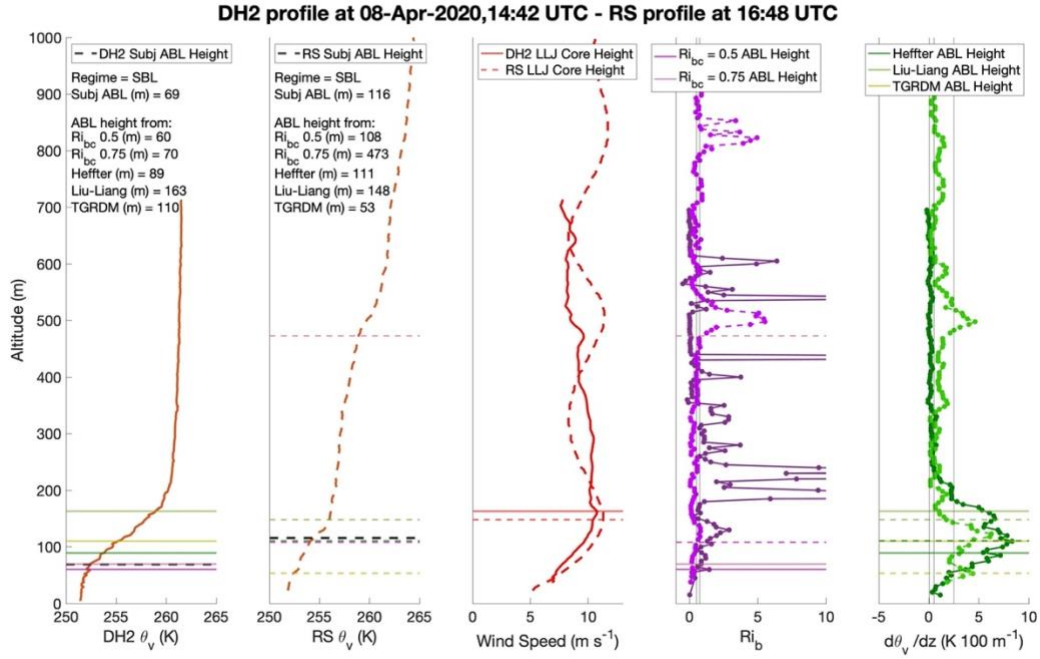
Figure S10: ABL height identification for DH2 flight on 8 April at 14:42 UTC and radiosonde profile at 16:48 UTC.
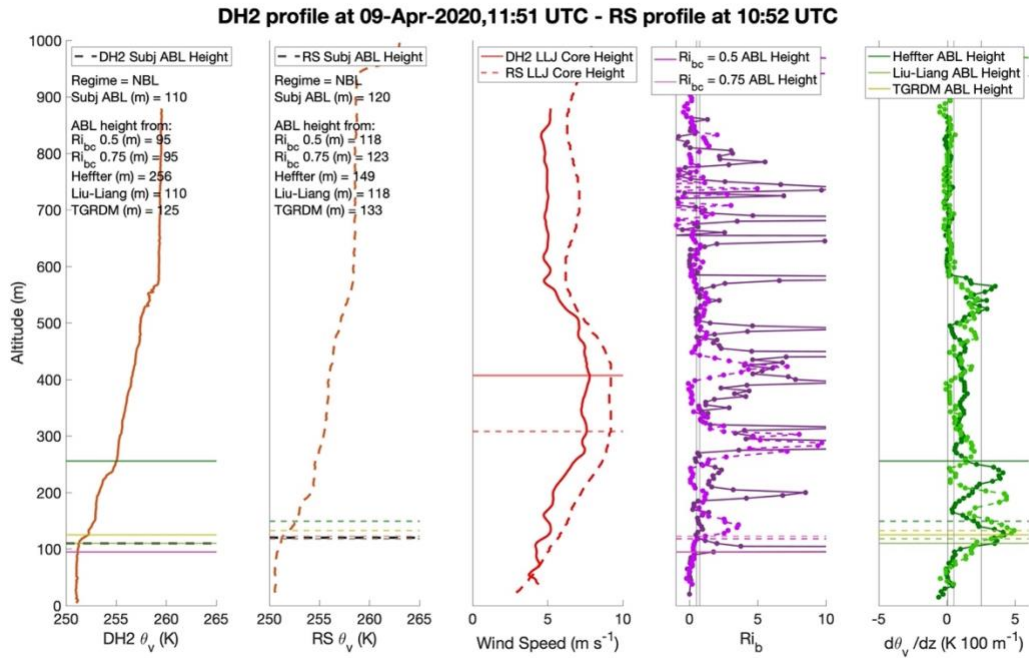
Figure S11: ABL height identification for DH2 flight on 9 April at 11:51 UTC and radiosonde profile at 10:52 UTC.
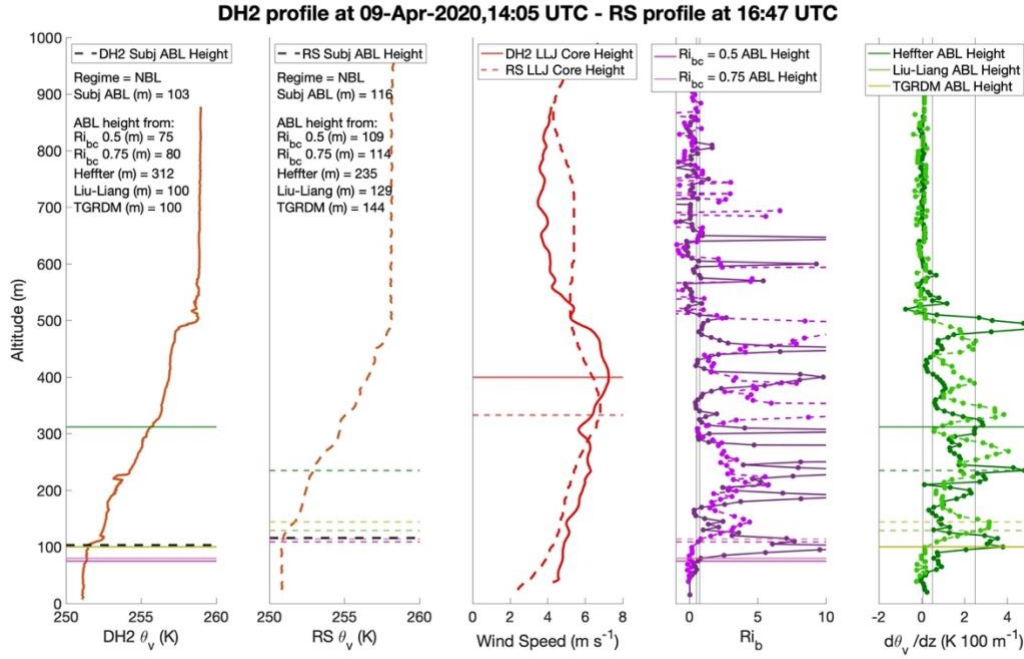
Figure S12: ABL height identification for DH2 flight on 9 April at 14:05 UTC and radiosonde profile at 16:47 UTC.
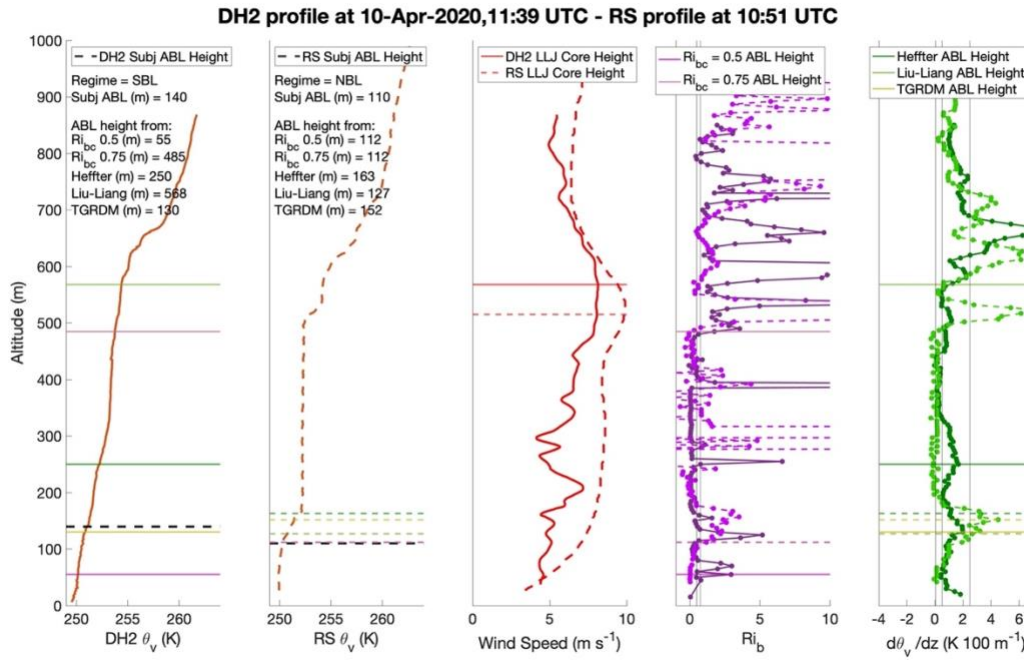
Figure S13: ABL height identification for DH2 flight on 10 April at 11:39 UTC and radiosonde profile at 10:51 UTC.
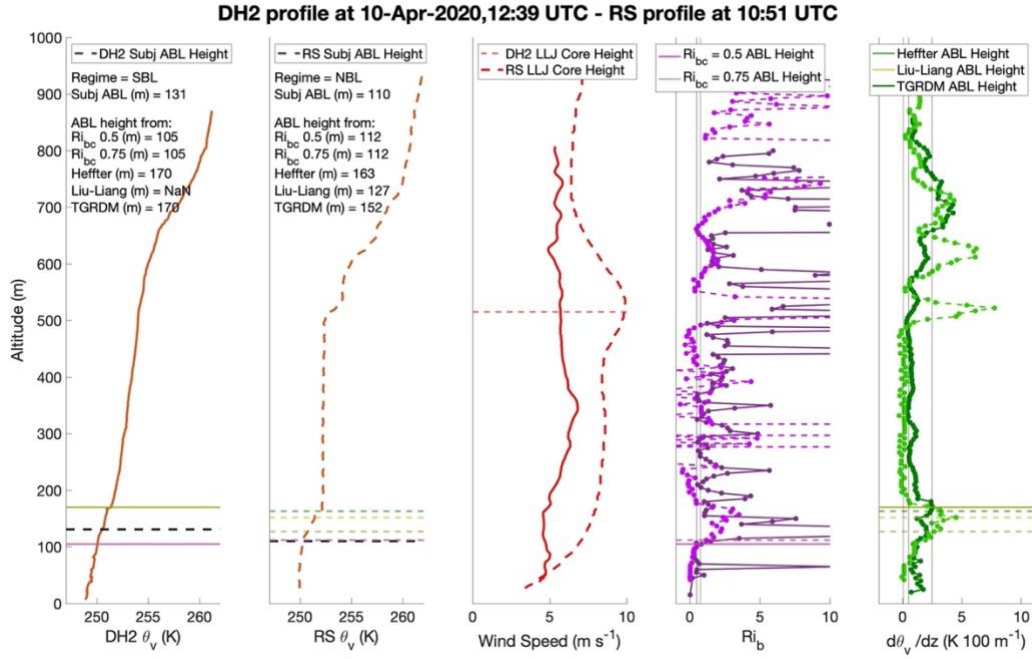
Figure S14: ABL height identification for DH2 flight on 10 April at 12:39 UTC and radiosonde profile at 10:51 UTC.
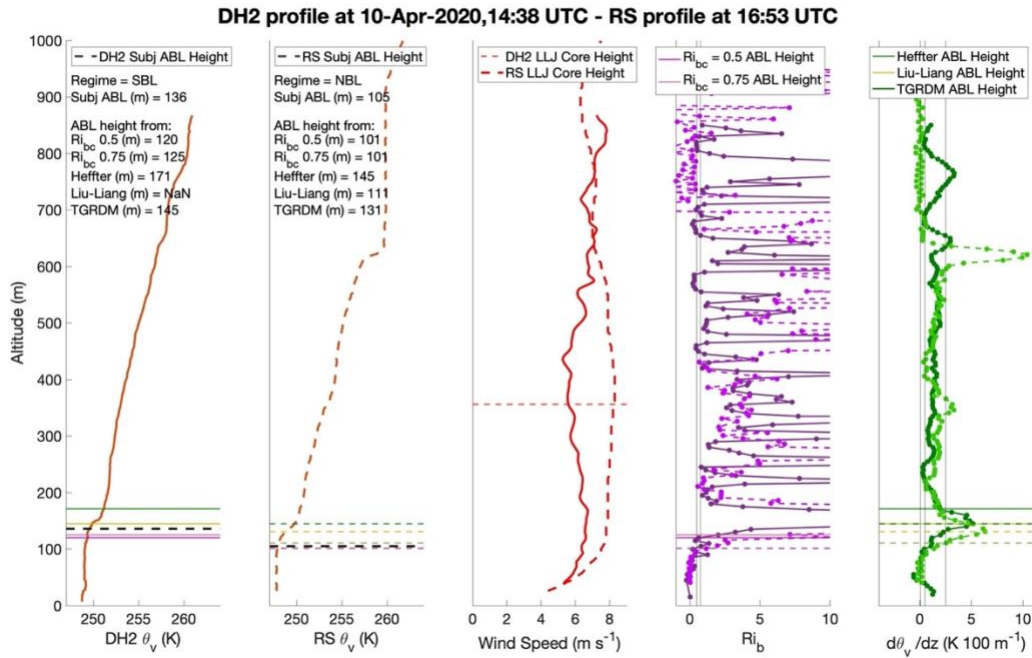
Figure S15: ABL height identification for DH2 flight on 10 April at 14:38 UTC and radiosonde profile at 16:53 UTC.
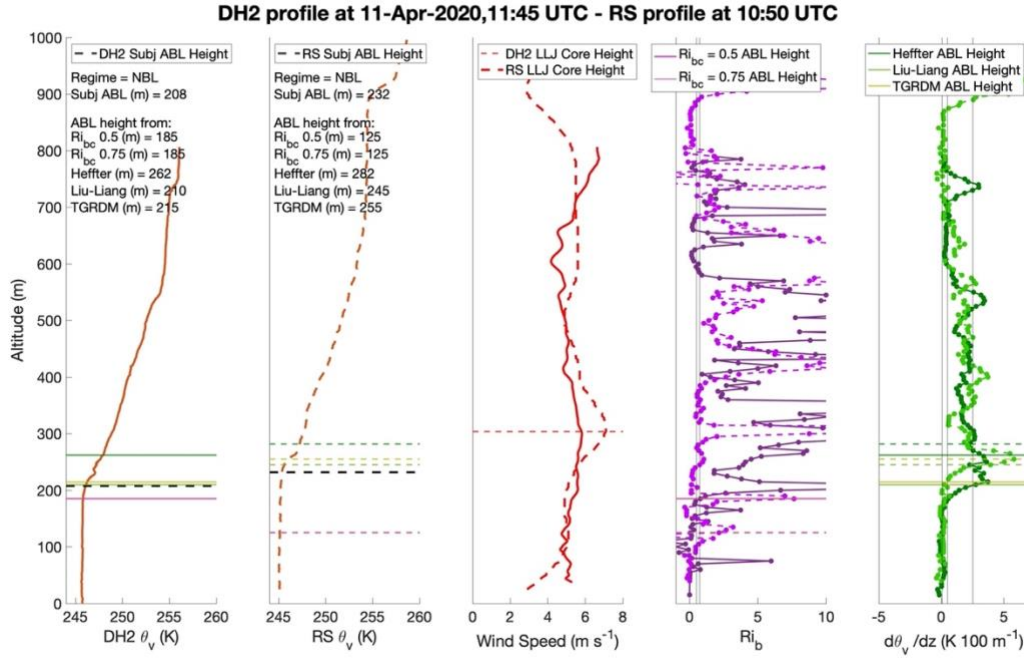
Figure S16: ABL height identification for DH2 flight on 11 April at 11:45 UTC and radiosonde profile at 10:50 UTC.
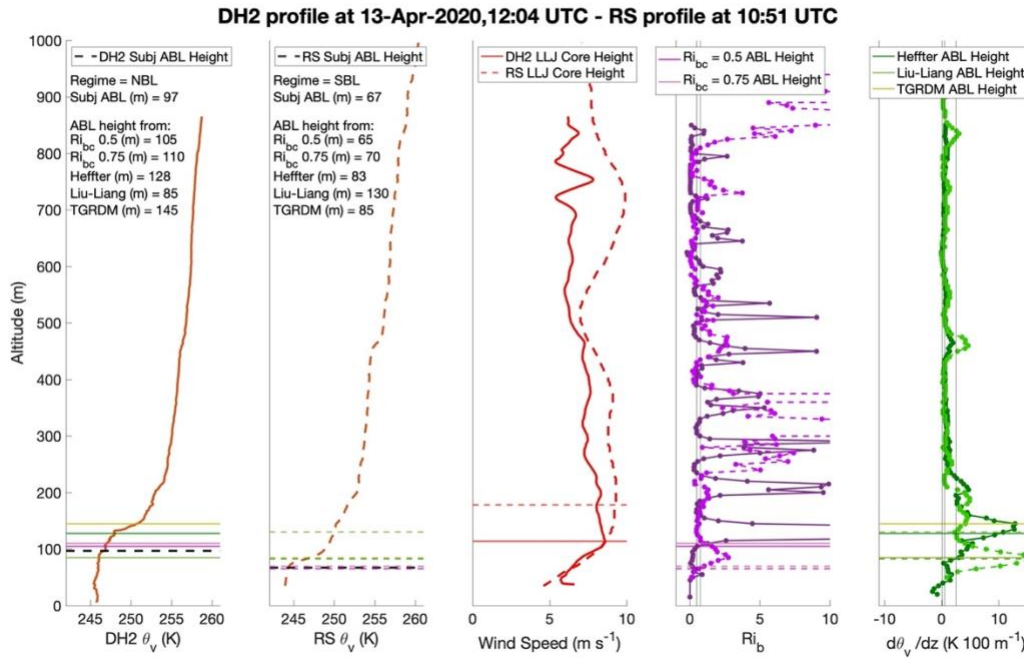
Figure S17: ABL height identification for DH2 flight on 13 April at 12:04 UTC and radiosonde profile at 10:51 UTC.
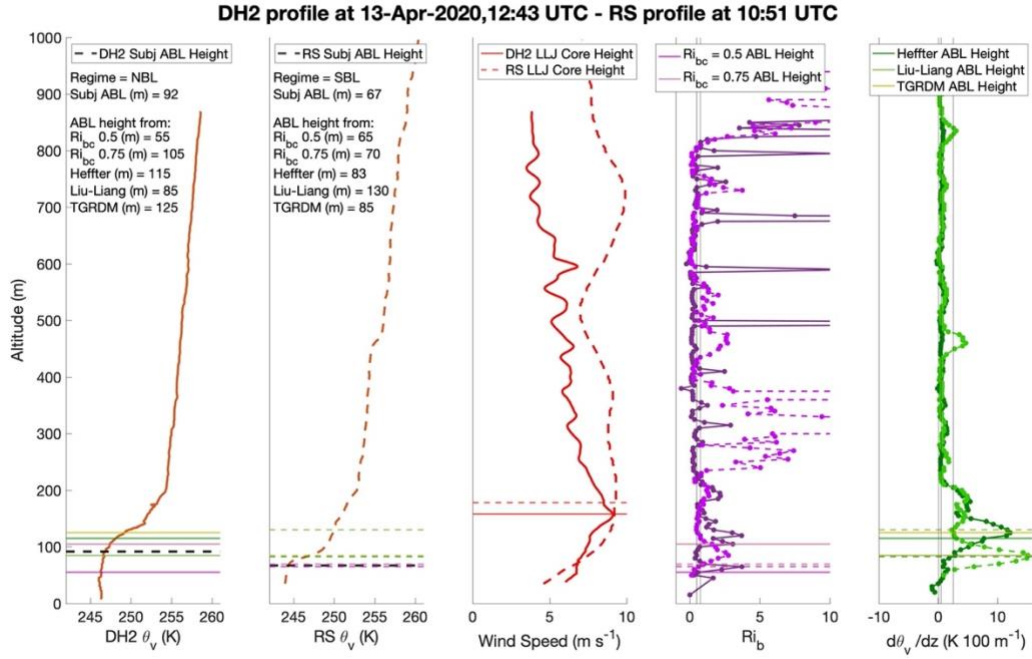
Figure S18: ABL height identification for DH2 flight on 13 April at 12:43 UTC and radiosonde profile at 10:51 UTC.
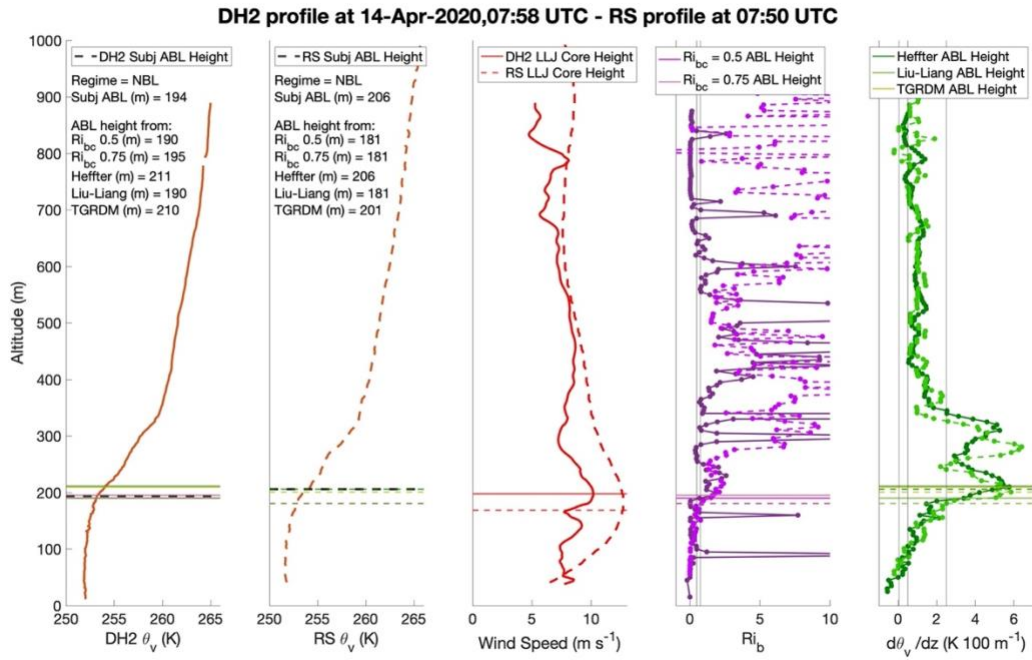
Figure S19: ABL height identification for DH2 flight on 14 April at 7:58 UTC and radiosonde profile at 7:50 UTC.
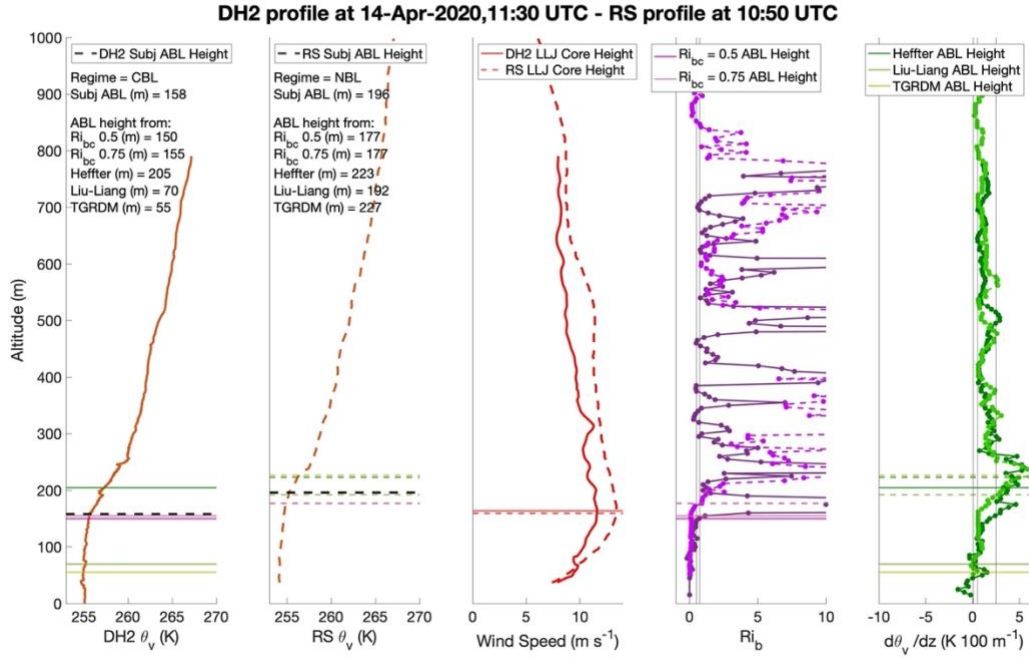
Figure S20: ABL height identification for DH2 flight on 14 April at 11:30 UTC and radiosonde profile at 10:50 UTC.
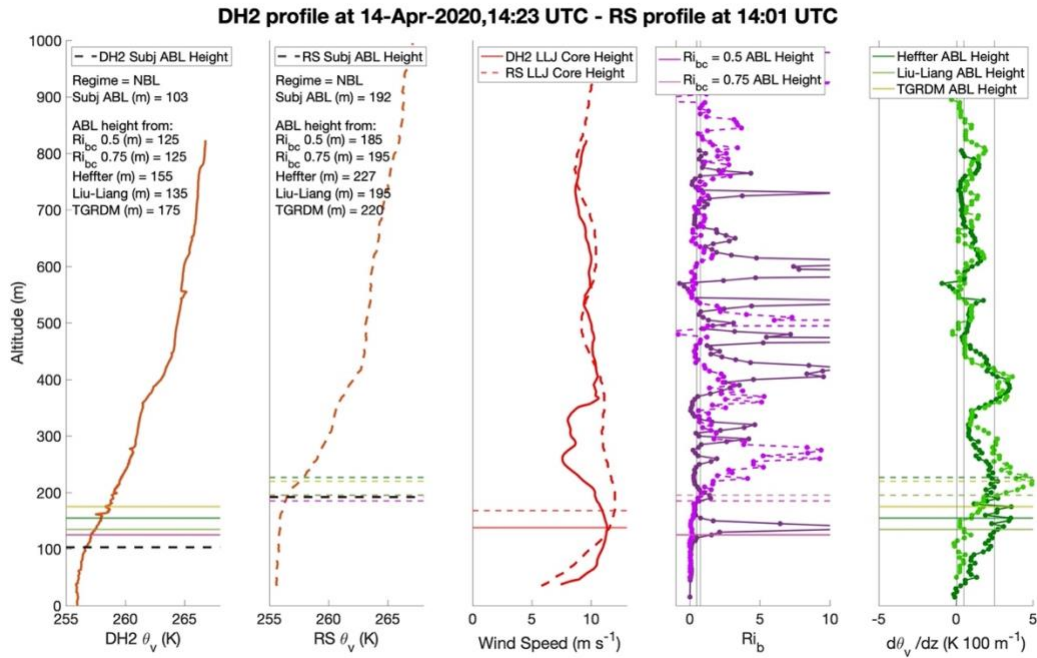
Figure S21: ABL height identification for DH2 flight on 14 April at 14:23 UTC and radiosonde profile at 14:01 UTC.
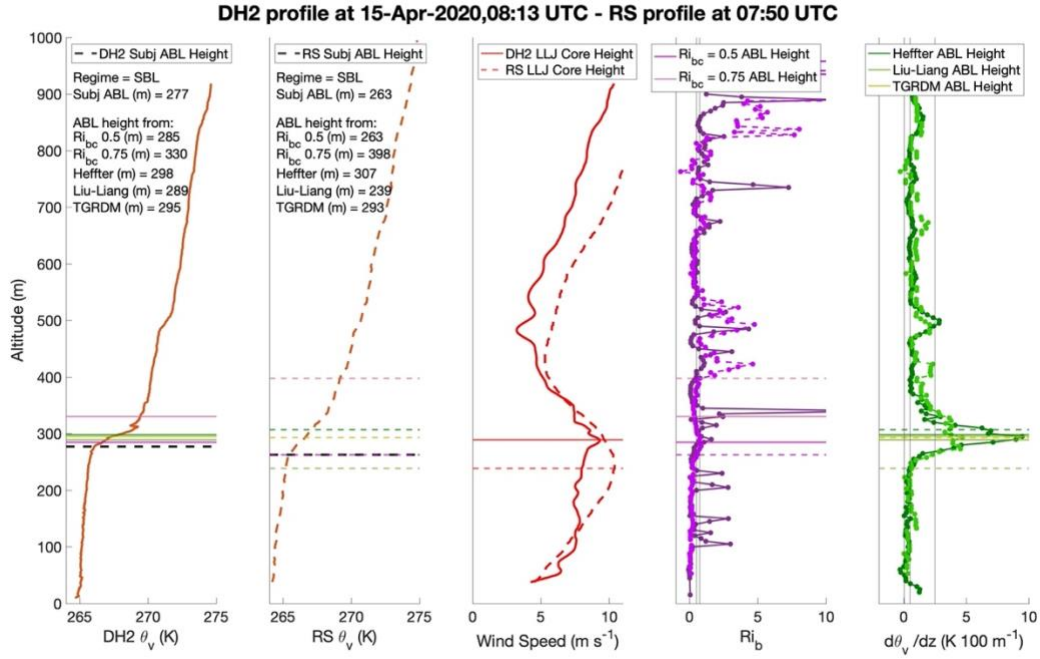
Figure S22: ABL height identification for DH2 flight on 15 April at 8:13 UTC and radiosonde profile at 7:50 UTC.
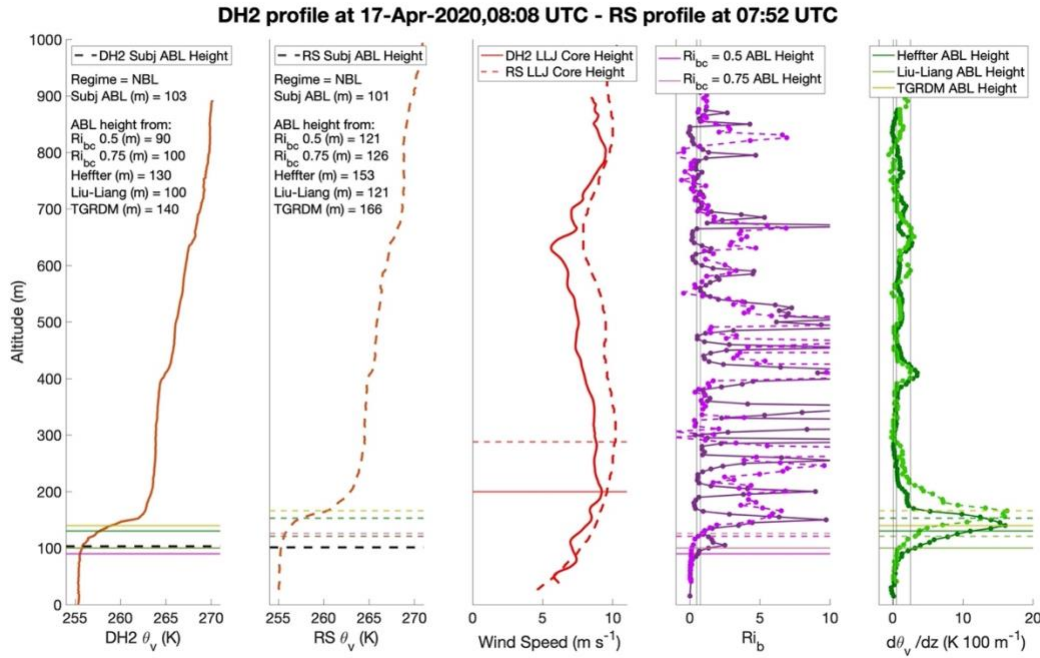
Figure S23: ABL height identification for DH2 flight on 17 April at 8:08 UTC and radiosonde profile at 7:52 UTC.
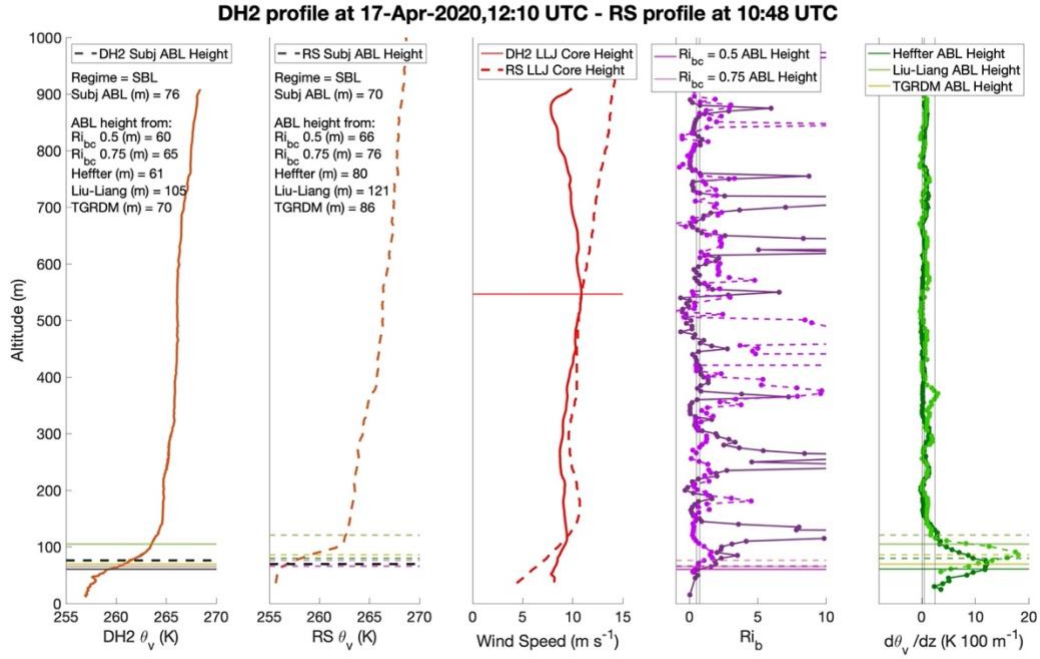
Figure S24: ABL height identification for DH2 flight on 17 April at 12:10 UTC and radiosonde profile at 10:48 UTC.
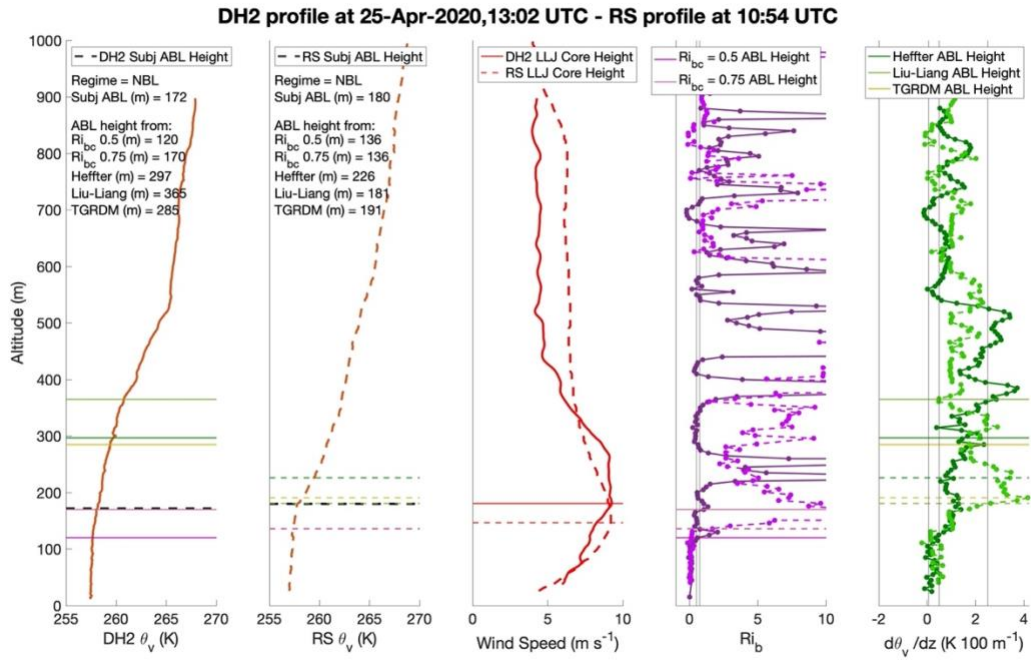
Figure S25: ABL height identification for DH2 flight on 25 April at 13:02 UTC and radiosonde profile at 10:54 UTC.
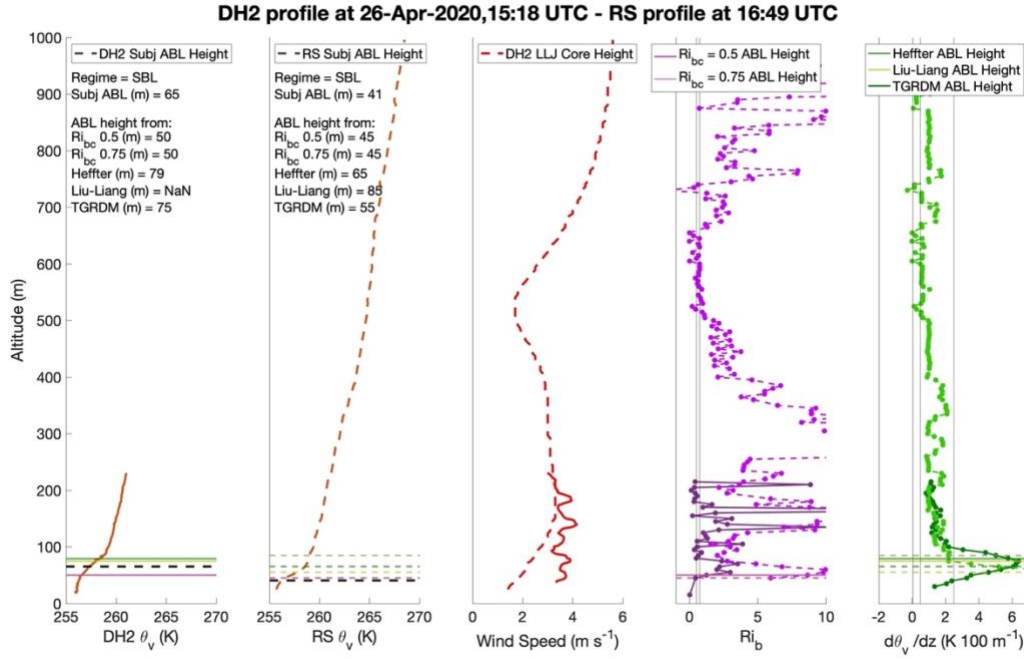
Figure S26: ABL height identification for DH2 flight on 26 April at 15:18 UTC and radiosonde profile at 16:49 UTC.
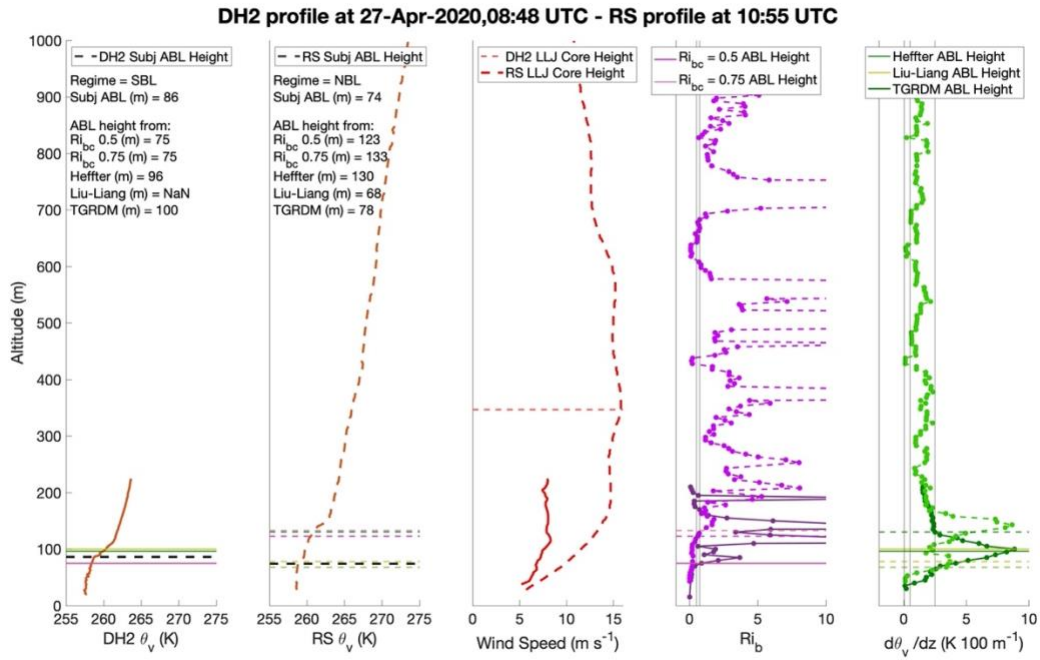
Figure S27: ABL height identification for DH2 flight on 27 April at 8:48 UTC and radiosonde profile at 10:55 UTC.
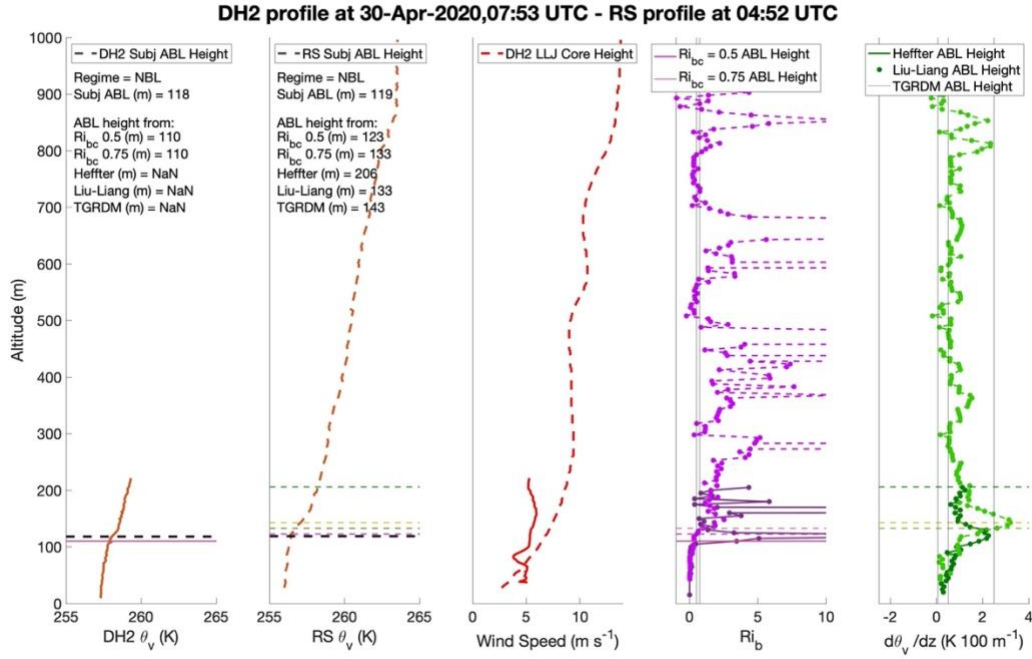
Figure S28: ABL height identification for DH2 flight on 30 April at 7:53 UTC and radiosonde profile at 4:52 UTC.
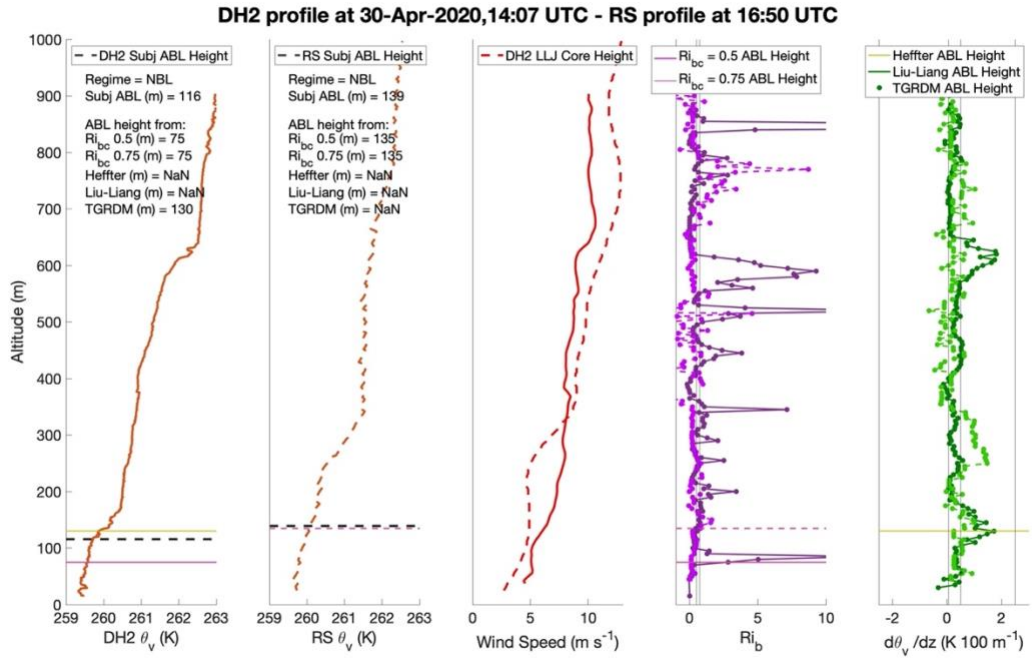
Figure S29: ABL height identification for DH2 flight on 30 April at 14:07 UTC and radiosonde profile at 16:50 UTC.
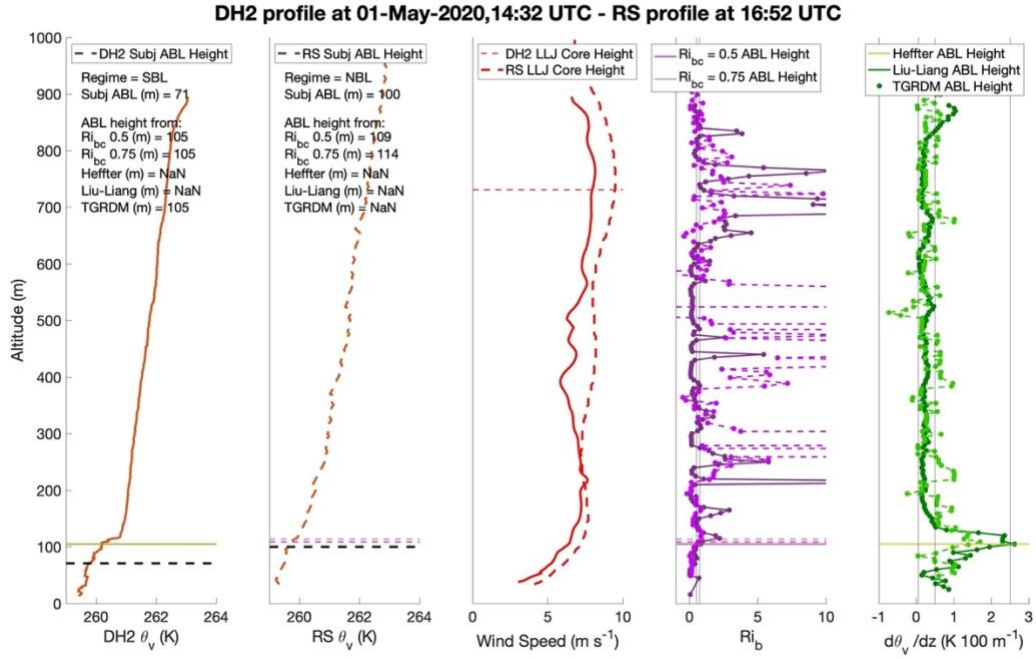
Figure S30: ABL height identification for DH2 flight on 1 May at 14:32 UTC and radiosonde profile at 16:52 UTC.
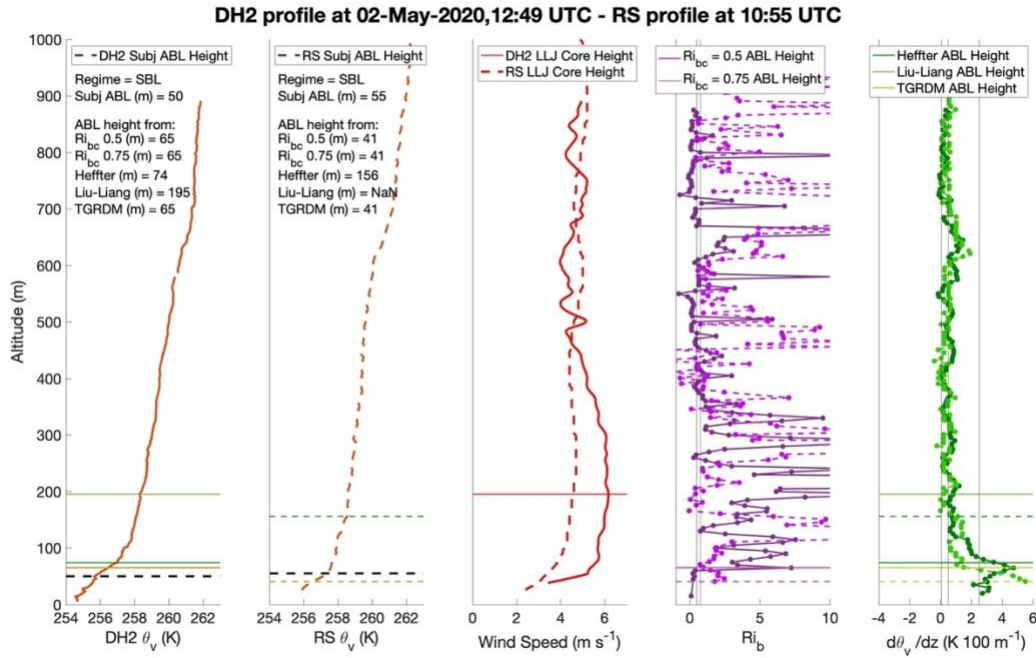
Figure S31: ABL height identification for DH2 flight on 2 May at 12:49 UTC and radiosonde profile at 10:55 UTC.
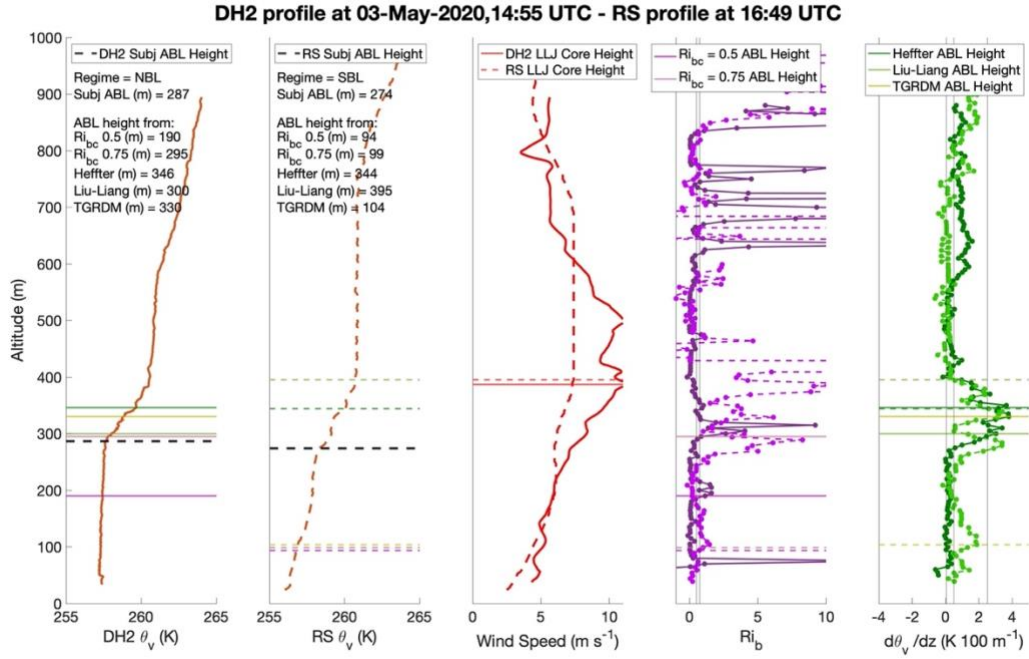
Figure S32: ABL height identification for DH2 flight on 3 May at 14:55 UTC and radiosonde profile at 16:49 UTC.
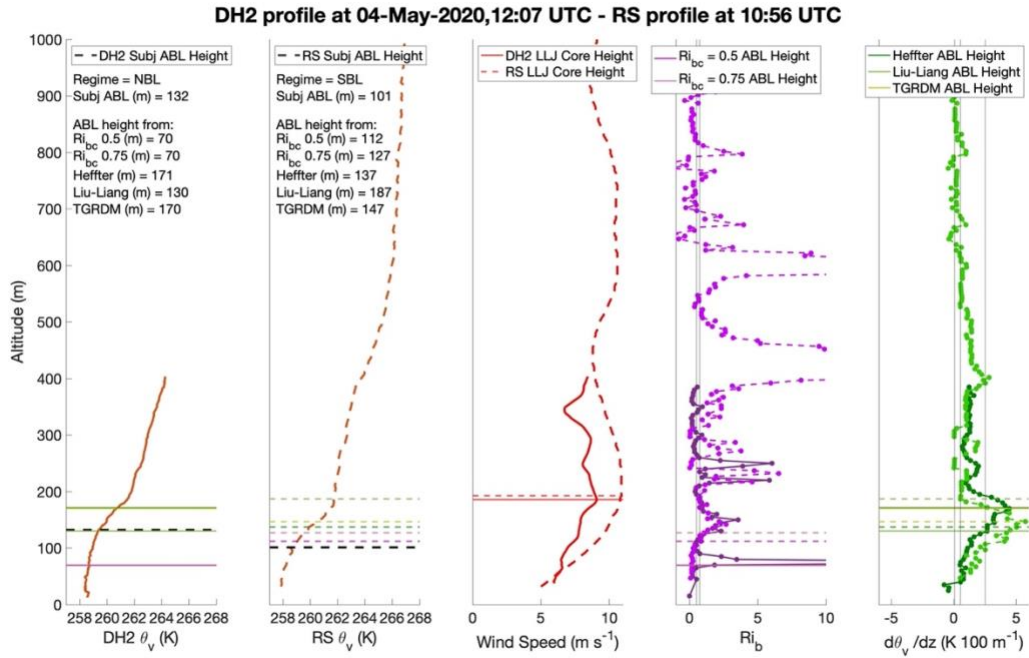
Figure S33: ABL height identification for DH2 flight on 4 May at 12:07 UTC and radiosonde profile at 10:56 UTC.
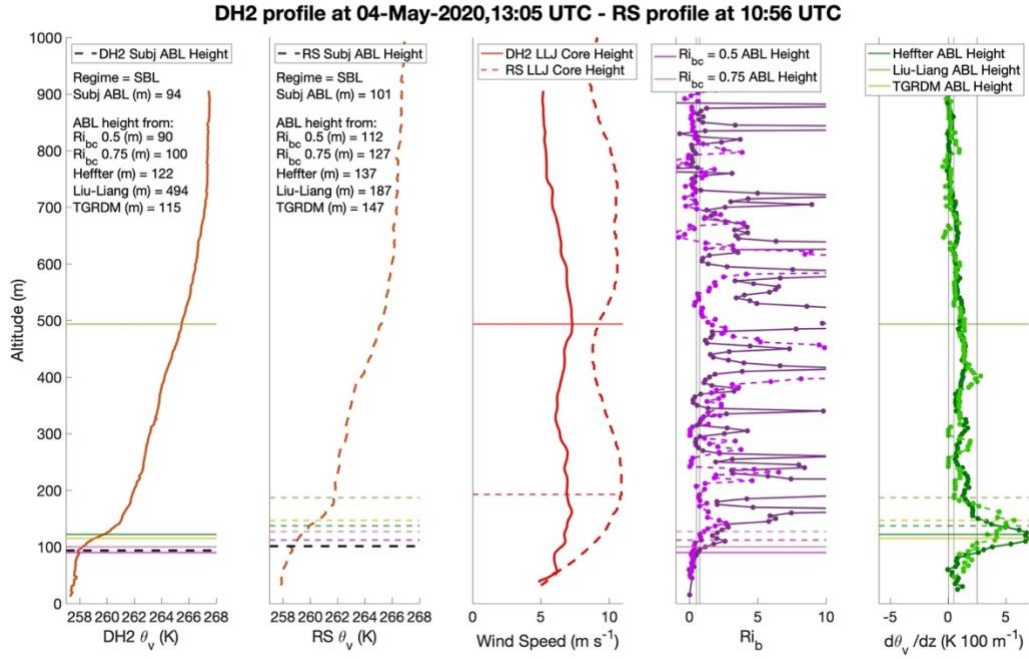
Figure S34: ABL height identification for DH2 flight on 4 May at 13:05 UTC and radiosonde profile at 10:56 UTC.
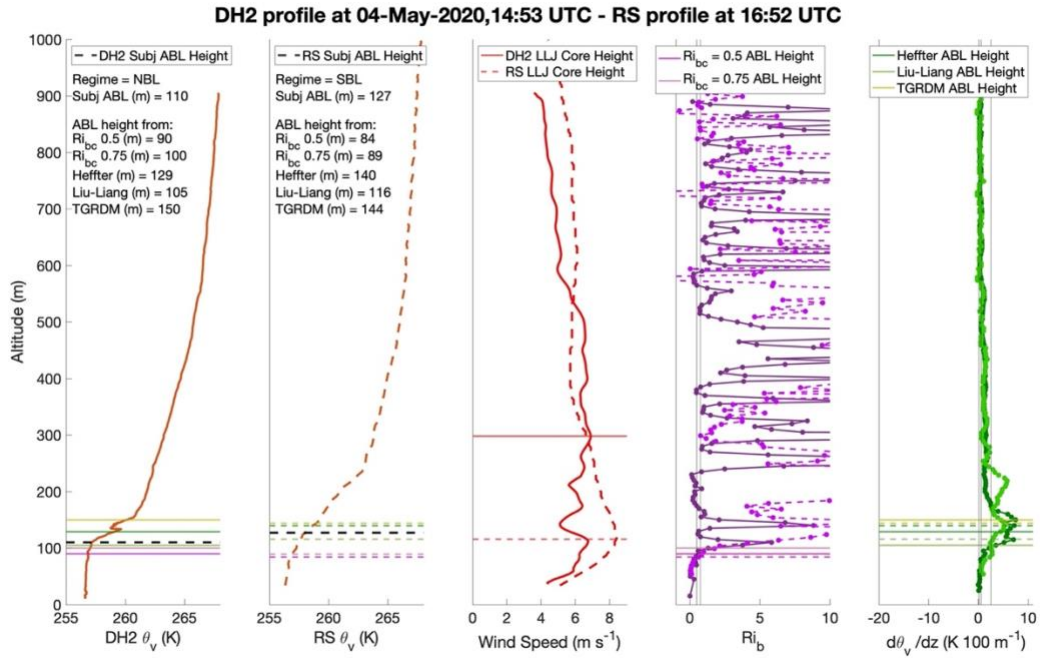
Figure S35: ABL height identification for DH2 flight on 4 May at 14:53 UTC and radiosonde profile at 16:52 UTC.
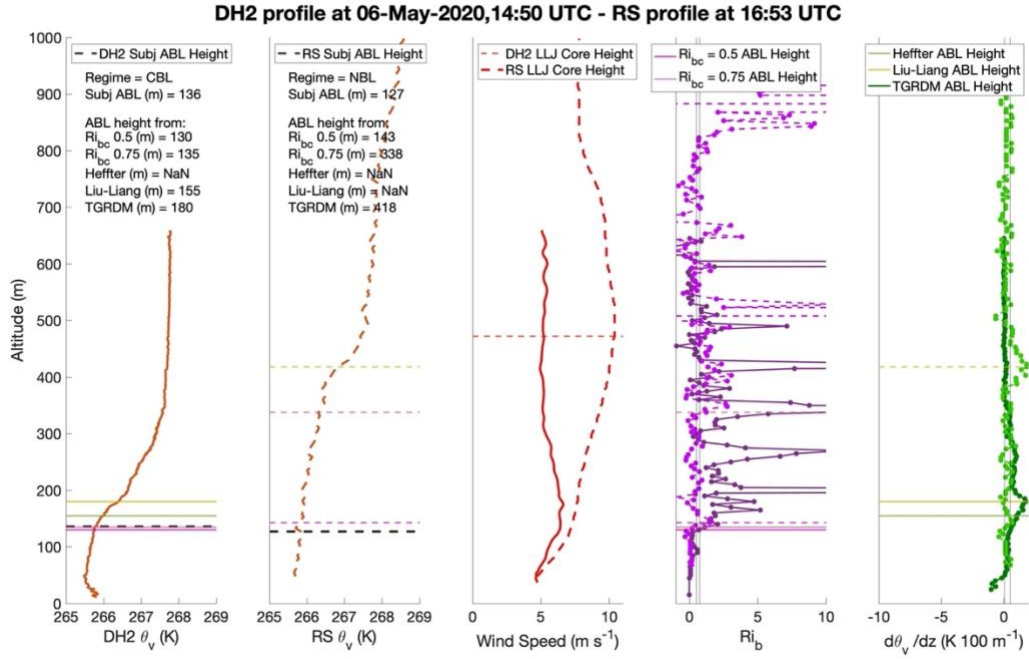
Figure S36: ABL height identification for DH2 flight on 6 May at 14:50 UTC and radiosonde profile at 16:53 UTC.
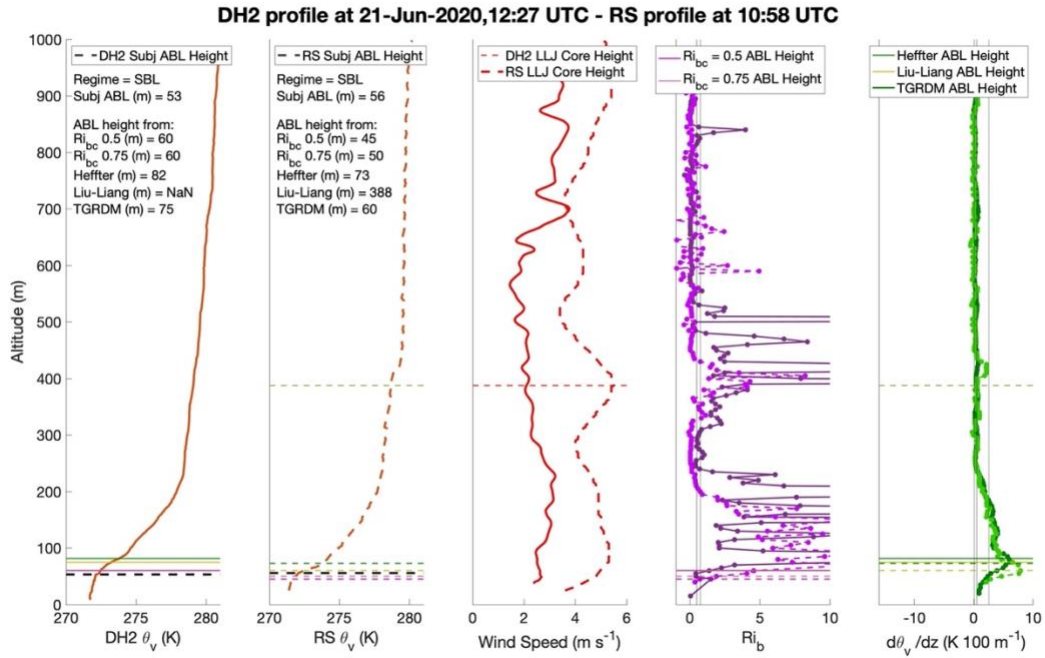
Figure S37: ABL height identification for DH2 flight on 21 June at 12:27 UTC and radiosonde profile at 10:58 UTC.
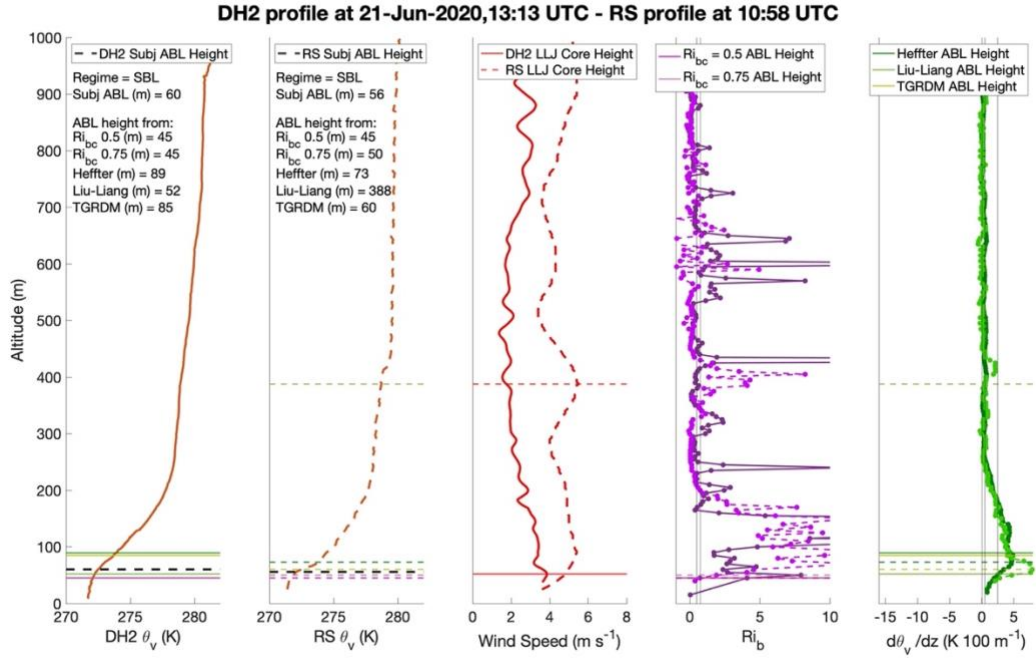
Figure S38: ABL height identification for DH2 flight on 21 June at 13:13 UTC and radiosonde profile at 10:58 UTC.
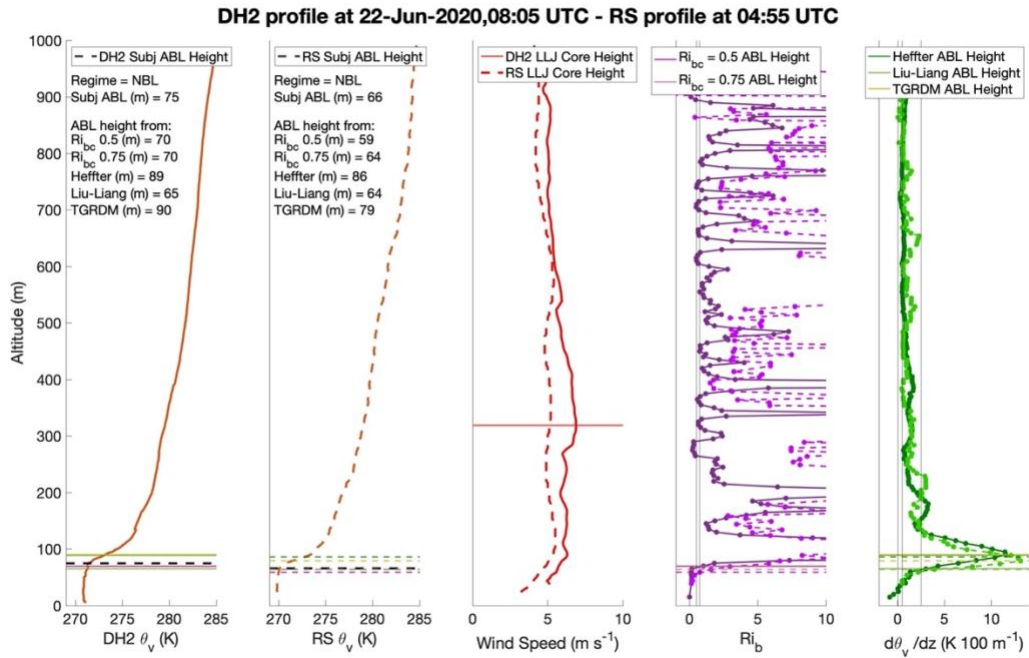
Figure S39: ABL height identification for DH2 flight on 22 June at 8:05 UTC and radiosonde profile at 4:55 UTC.
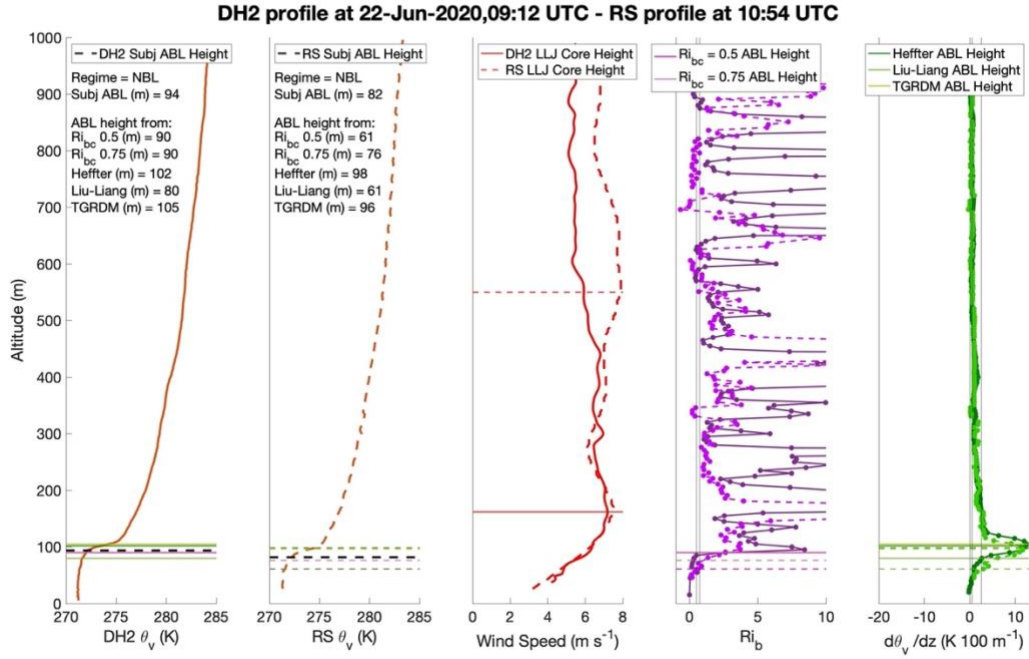
Figure S40: ABL height identification for DH2 flight on 22 June at 9:12 UTC and radiosonde profile at 10:54 UTC.
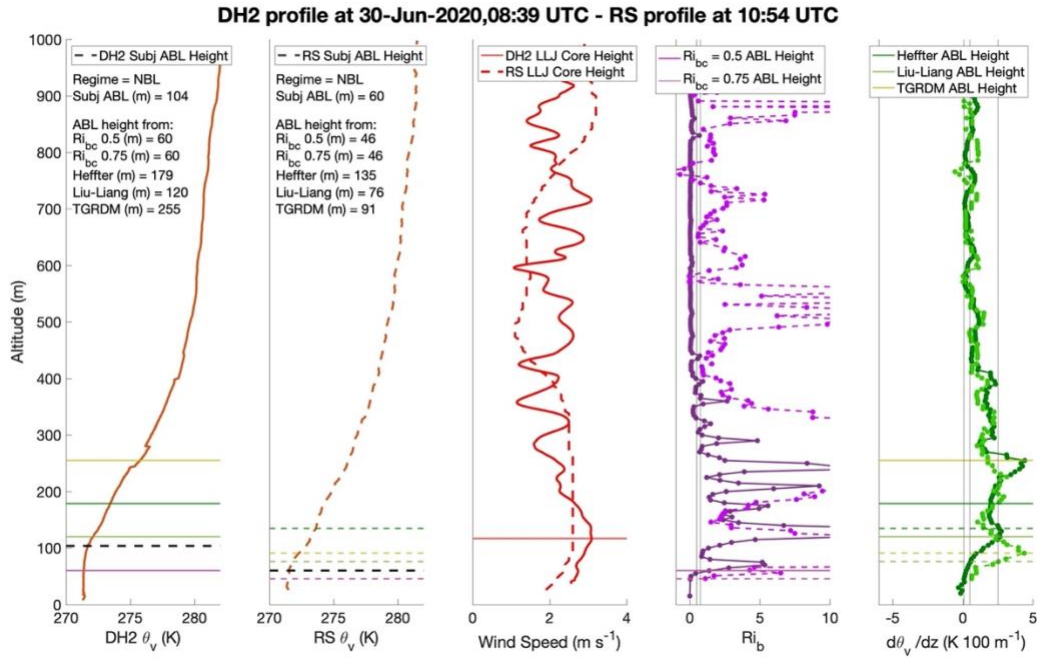
Figure S41: ABL height identification for DH2 flight on 30 June at 8:39 UTC and radiosonde profile at 10:54 UTC.
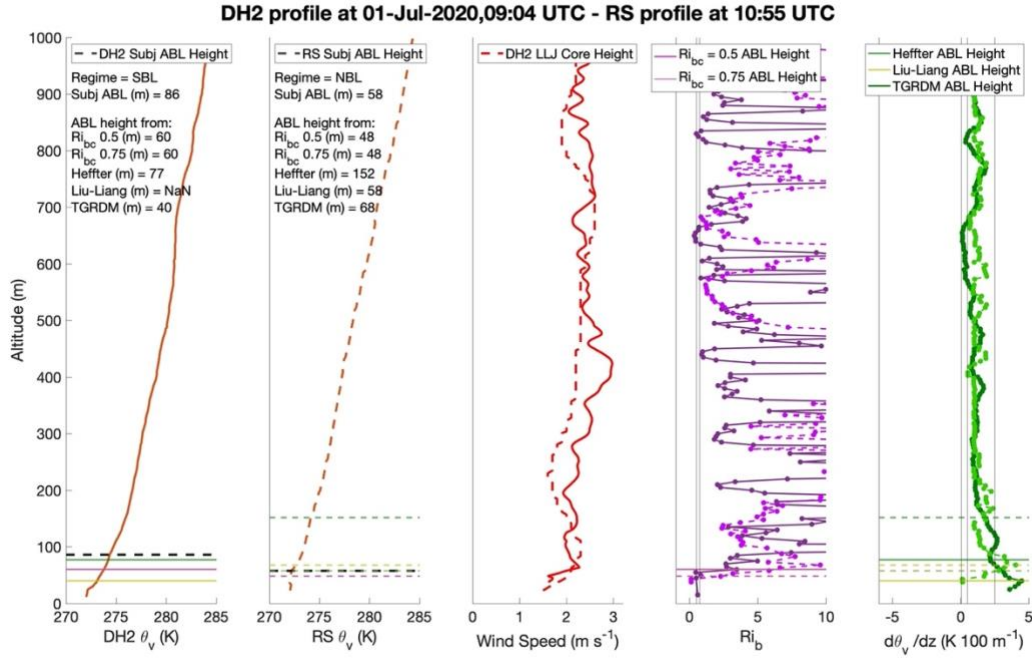
Figure S42: ABL height identification for DH2 flight on 1 July at 9:04 UTC and radiosonde profile at 10:55 UTC.
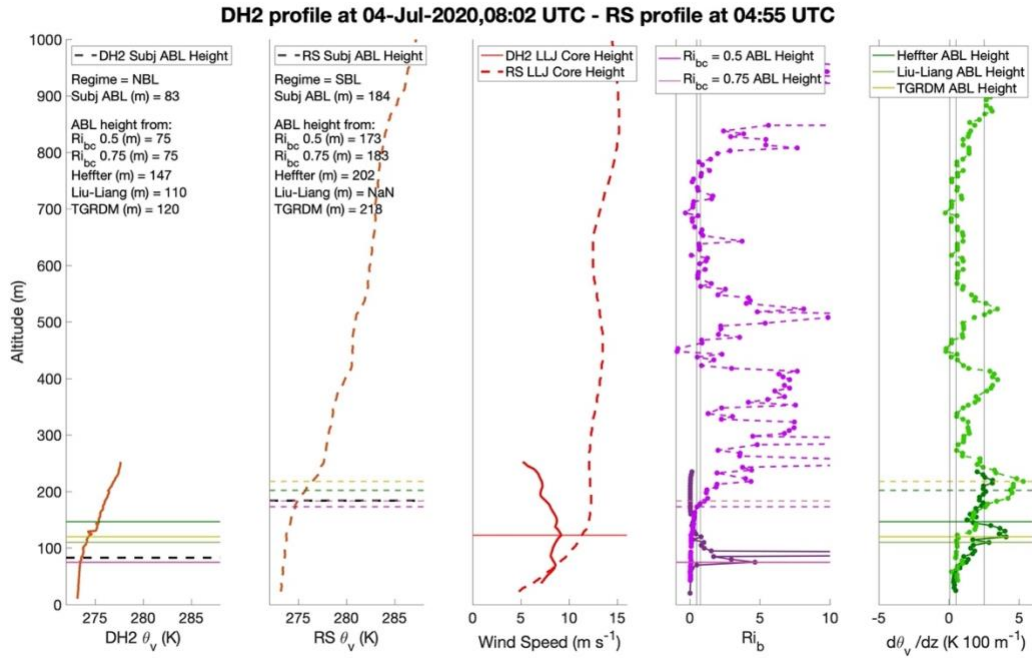
Figure S43: ABL height identification for DH2 flight on 4 July at 8:02 UTC and radiosonde profile at 4:55 UTC.
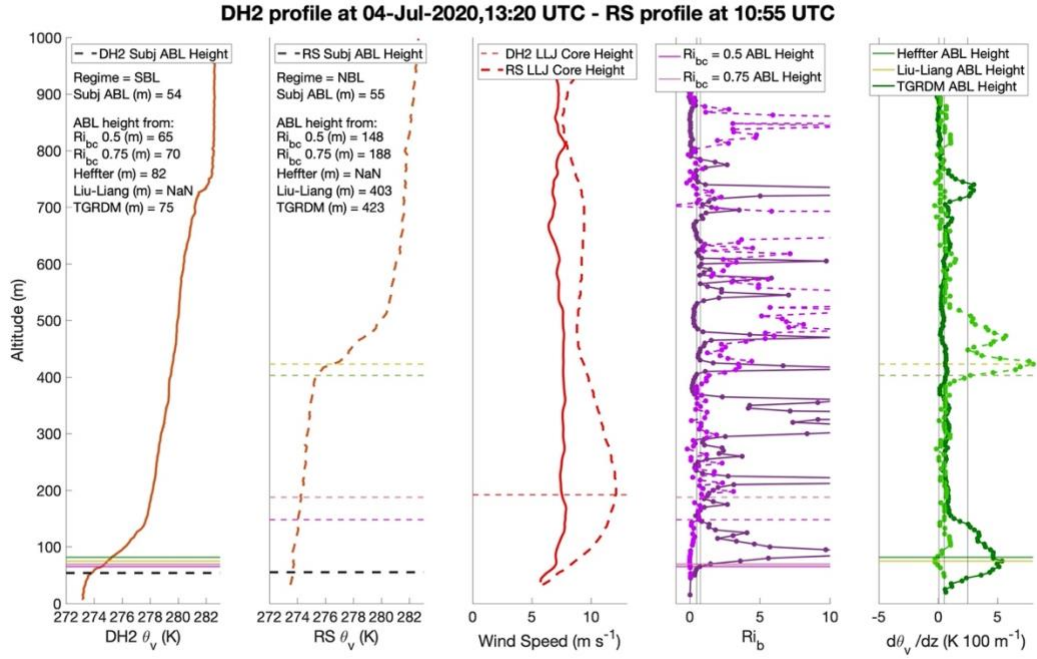
Figure S44: ABL height identification for DH2 flight on 4 July at 13:20 UTC and radiosonde profile at 10:55 UTC.
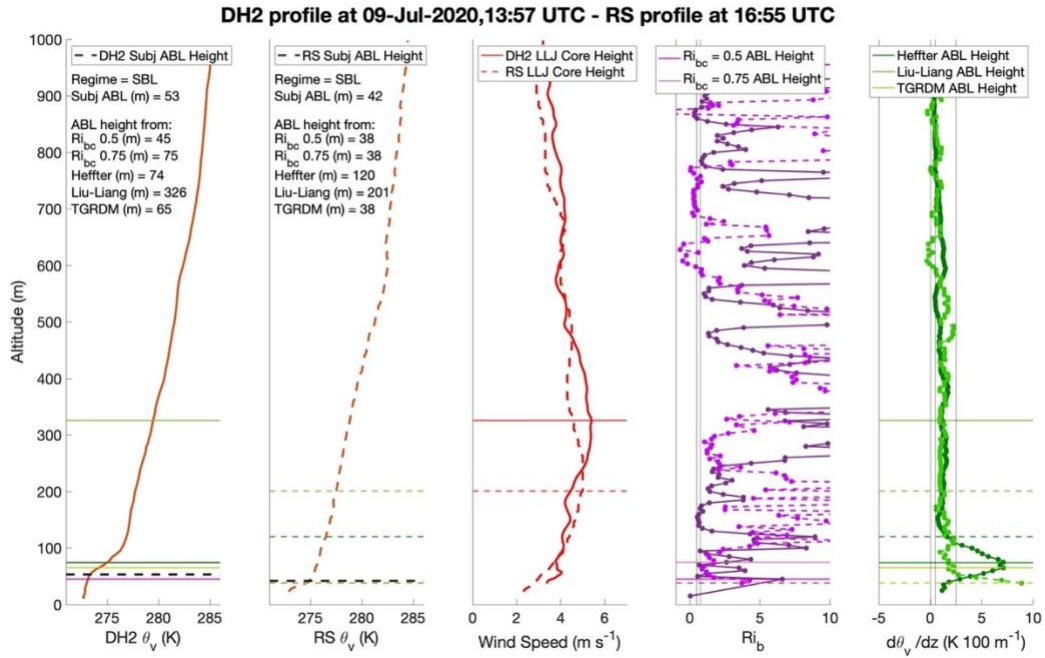
Figure S45: ABL height identification for DH2 flight on 9 July at 13:57 UTC and radiosonde profile at 16:55 UTC.
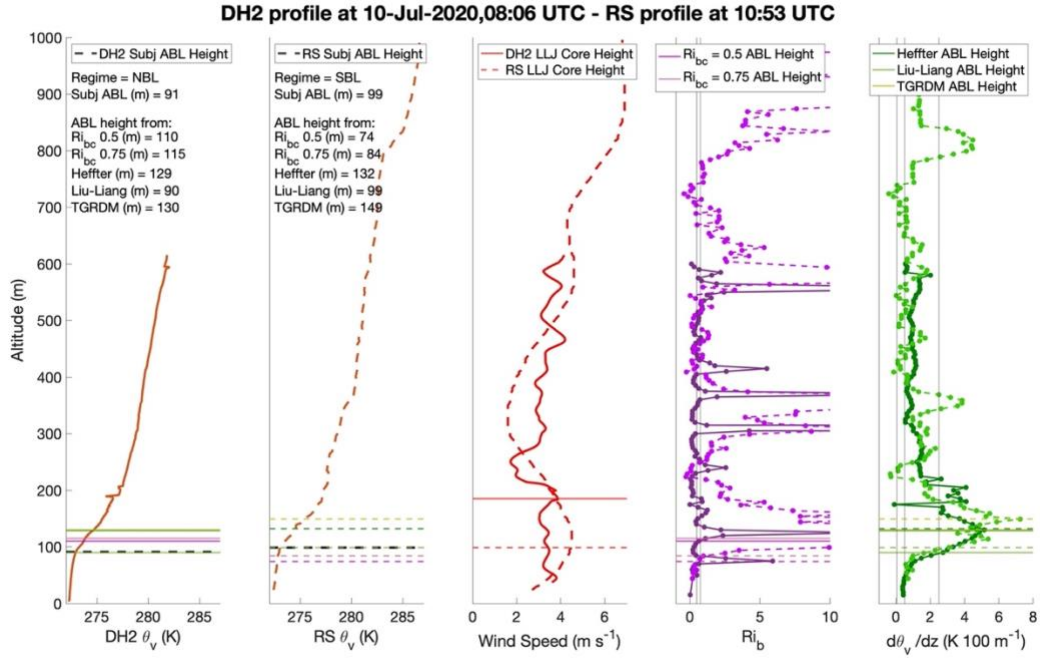
Figure S46: ABL height identification for DH2 flight on 10 July at 8:06 UTC and radiosonde profile at 10:53 UTC.
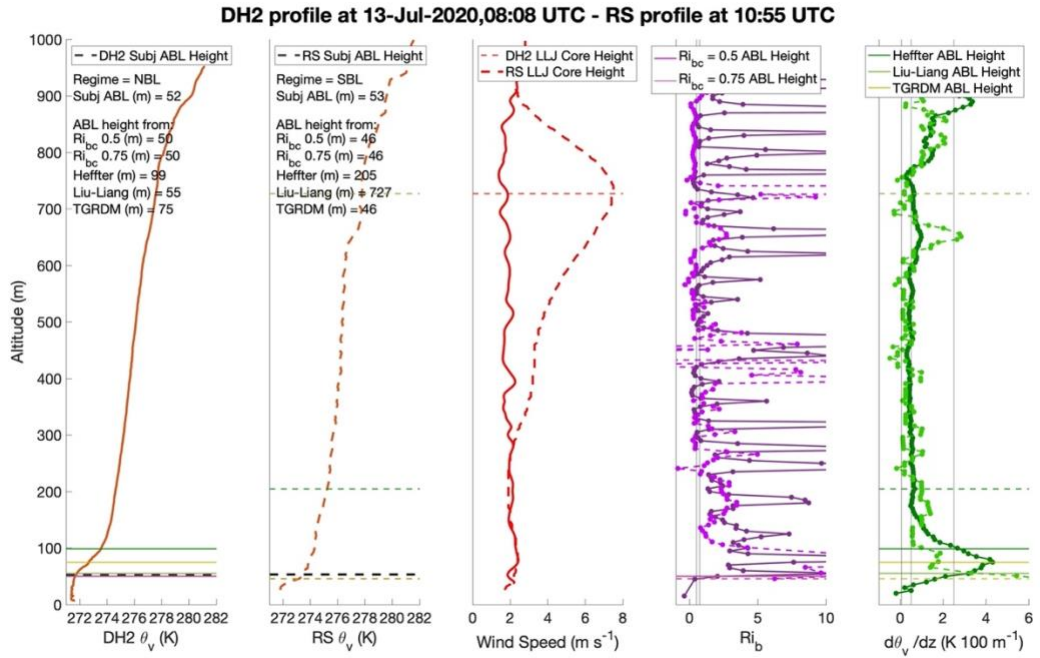
Figure S47: ABL height identification for DH2 flight on 13 July at 8:08 UTC and radiosonde profile at 10:55 UTC.
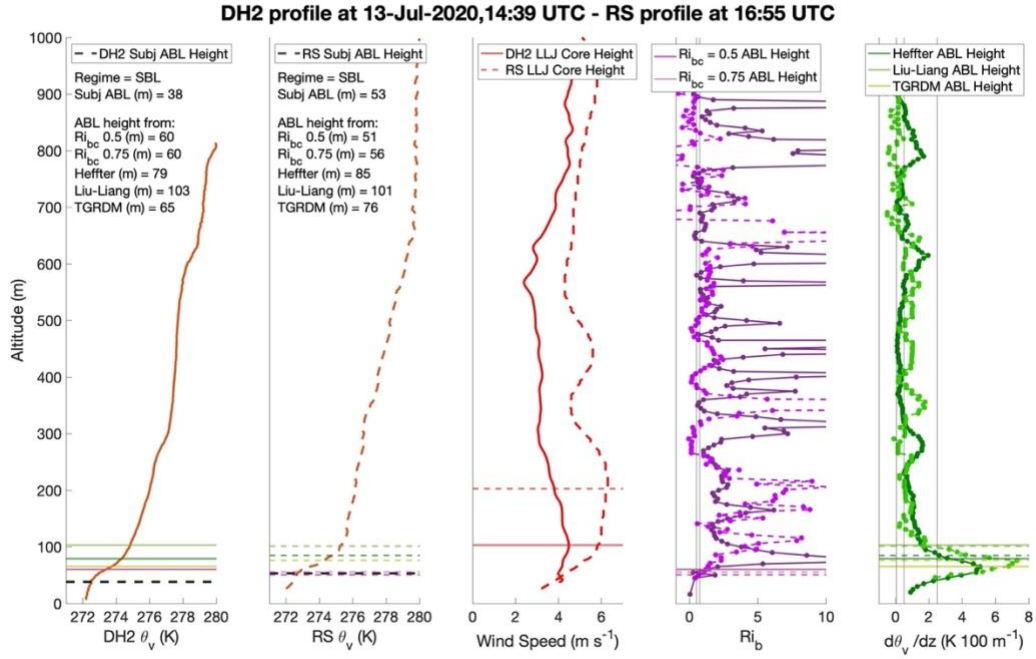
Figure S48: ABL height identification for DH2 flight on 13 July at 14:39 UTC and radiosonde profile at 16:55 UTC.
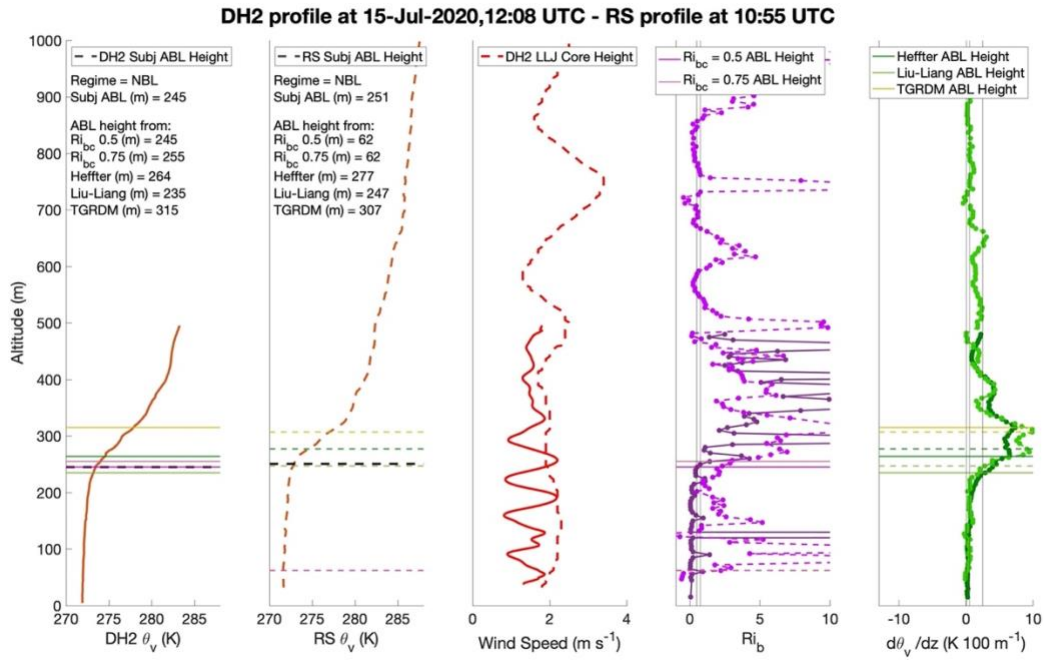
Figure S49: ABL height identification for DH2 flight on 15 July at 12:08 UTC and radiosonde profile at 10:55 UTC.
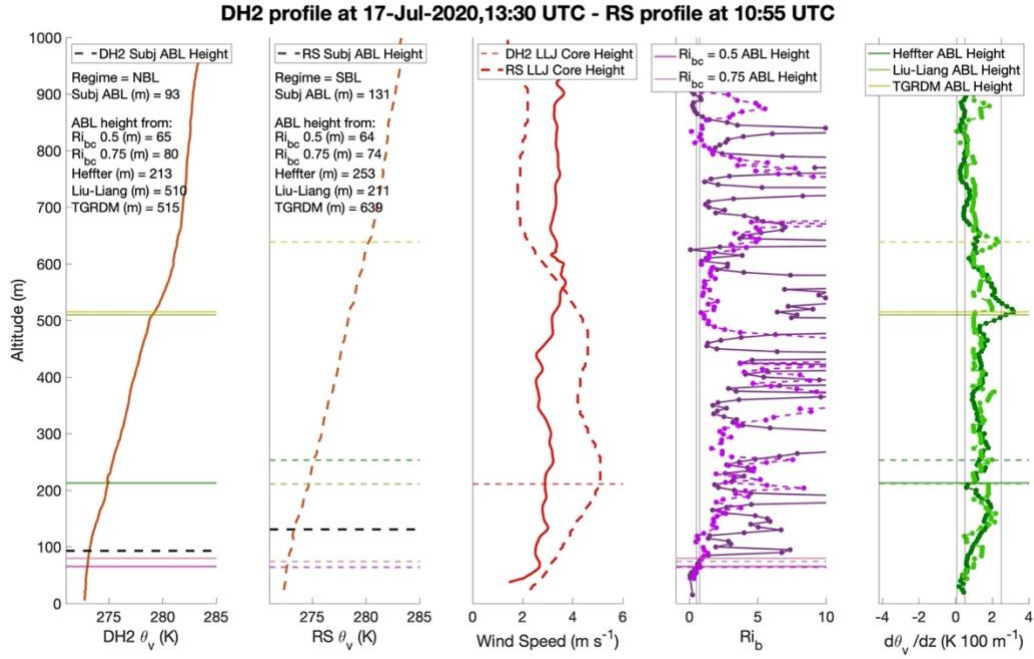
Figure S50: ABL height identification for DH2 flight on 17 July at 13:30 UTC and radiosonde profile at 10:55 UTC.
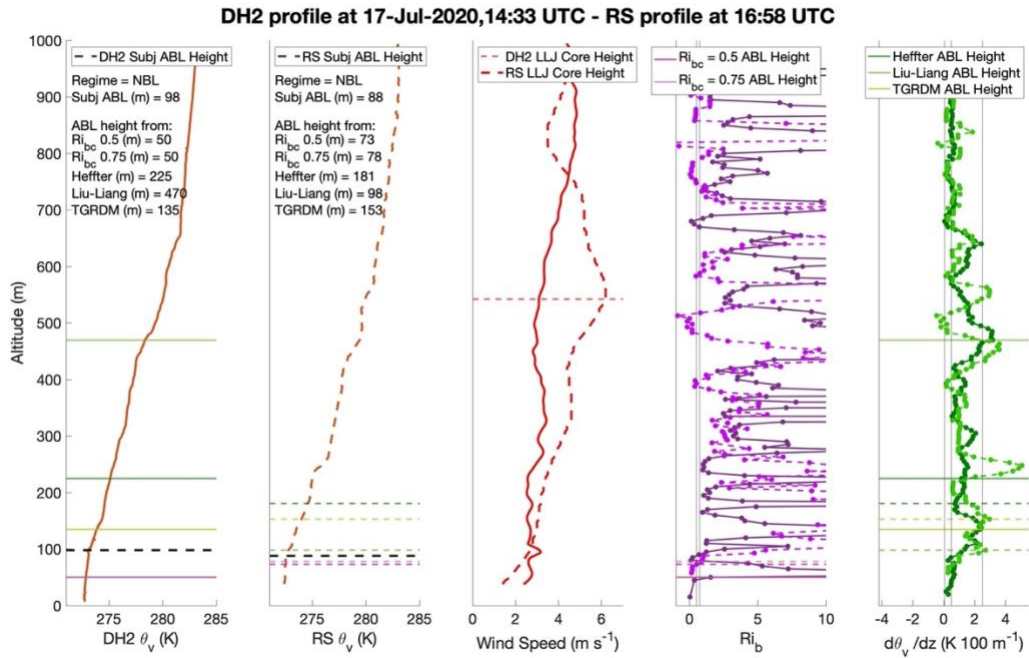
Figure S51: ABL height identification for DH2 flight on 17 July at 14:33 UTC and radiosonde profile at 16:58 UTC.
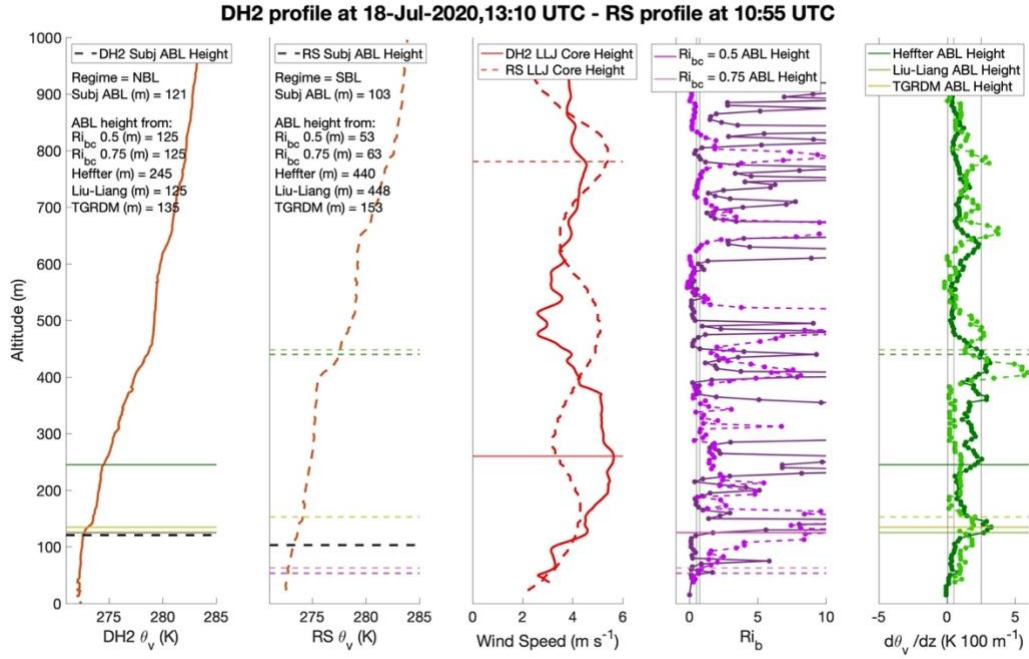
Figure S52: ABL height identification for DH2 flight on 18 July at 13:10 UTC and radiosonde profile at 10:55 UTC.
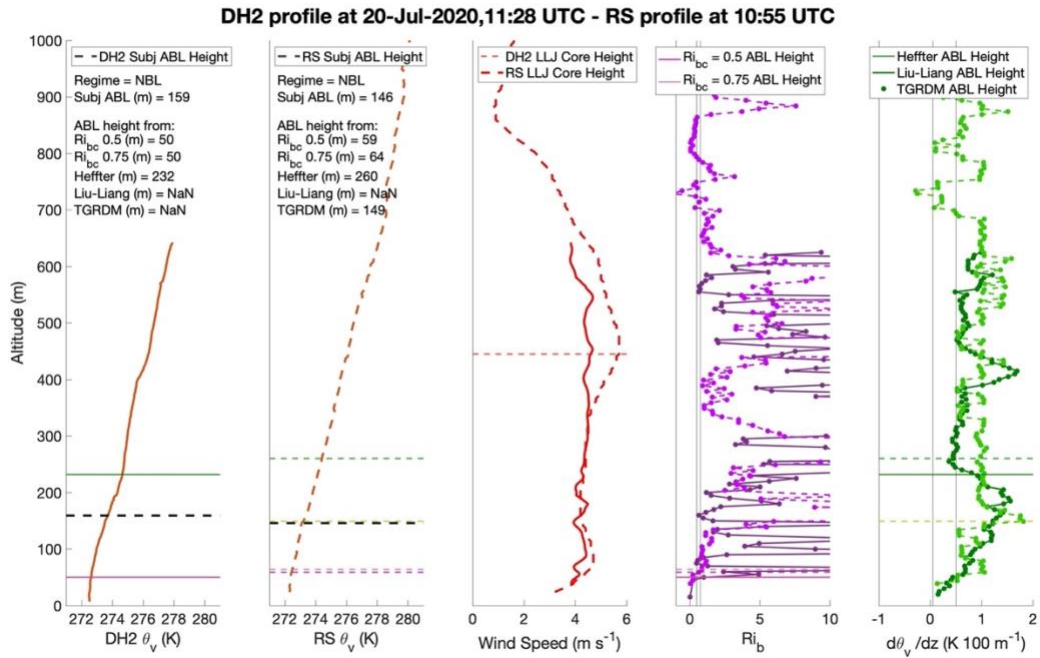
Figure S53: ABL height identification for DH2 flight on 20 July at 11:28 UTC and radiosonde profile at 10:55 UTC.
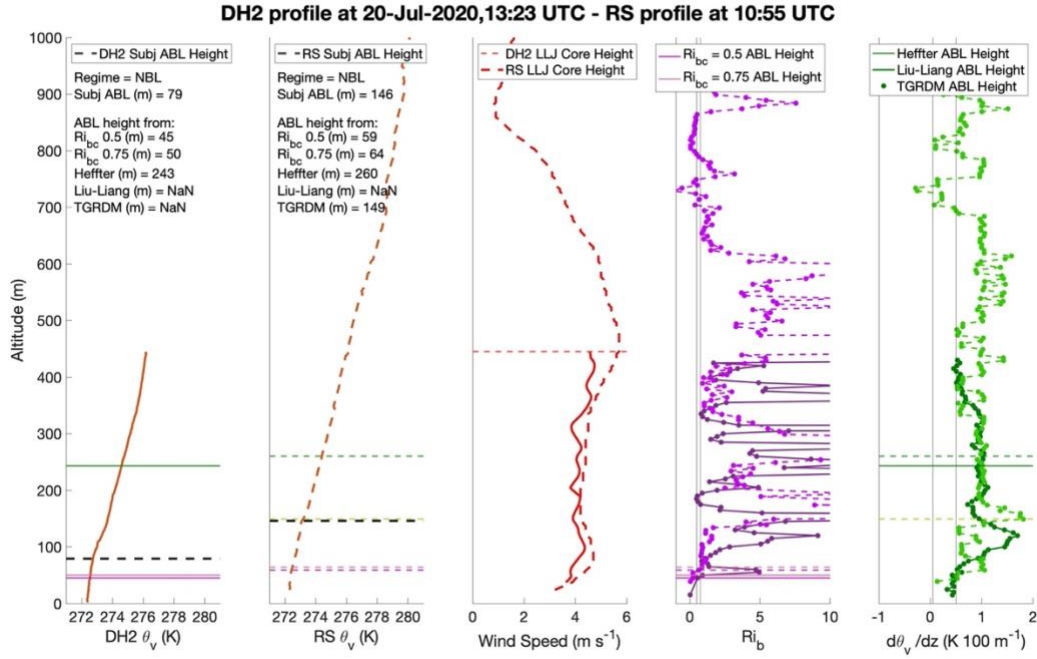
Figure S54: ABL height identification for DH2 flight on 20 July at 13:23 UTC and radiosonde profile at 10:55 UTC.
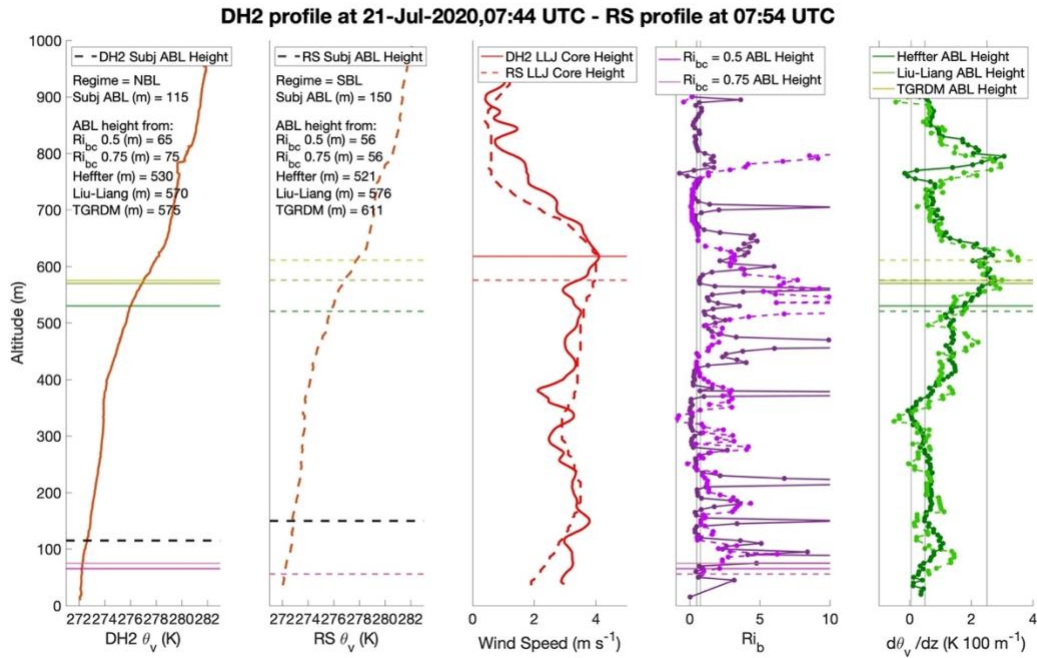
Figure S55: ABL height identification for DH2 flight on 21 July at 7:44 UTC and radiosonde profile at 7:54 UTC.
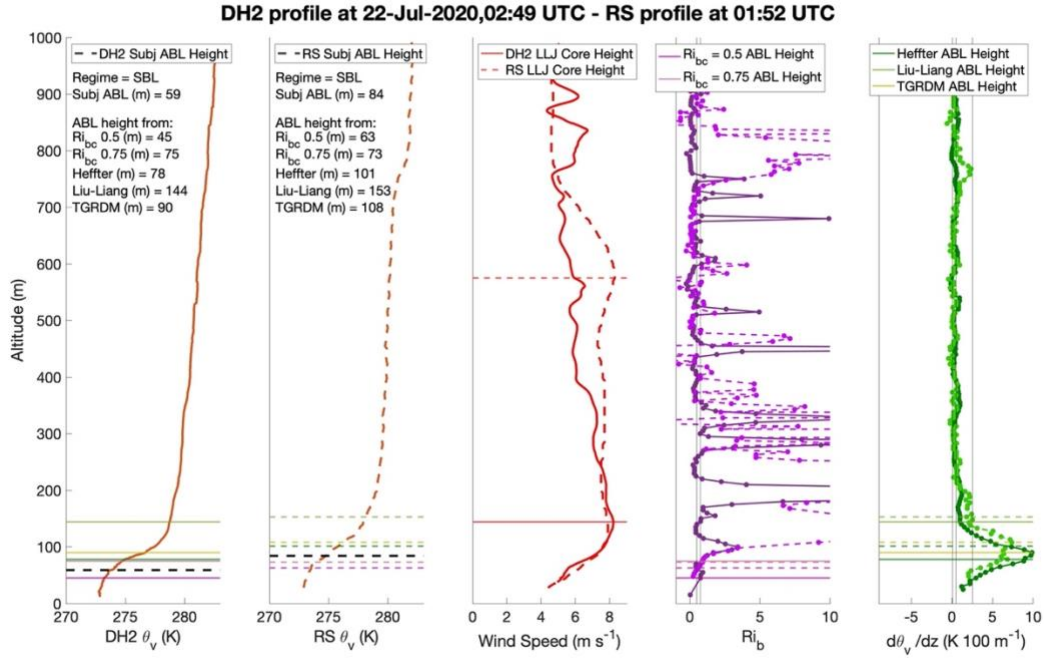
Figure S56: ABL height identification for DH2 flight on 22 July at 2:49 UTC and radiosonde profile at 1:52 UTC.
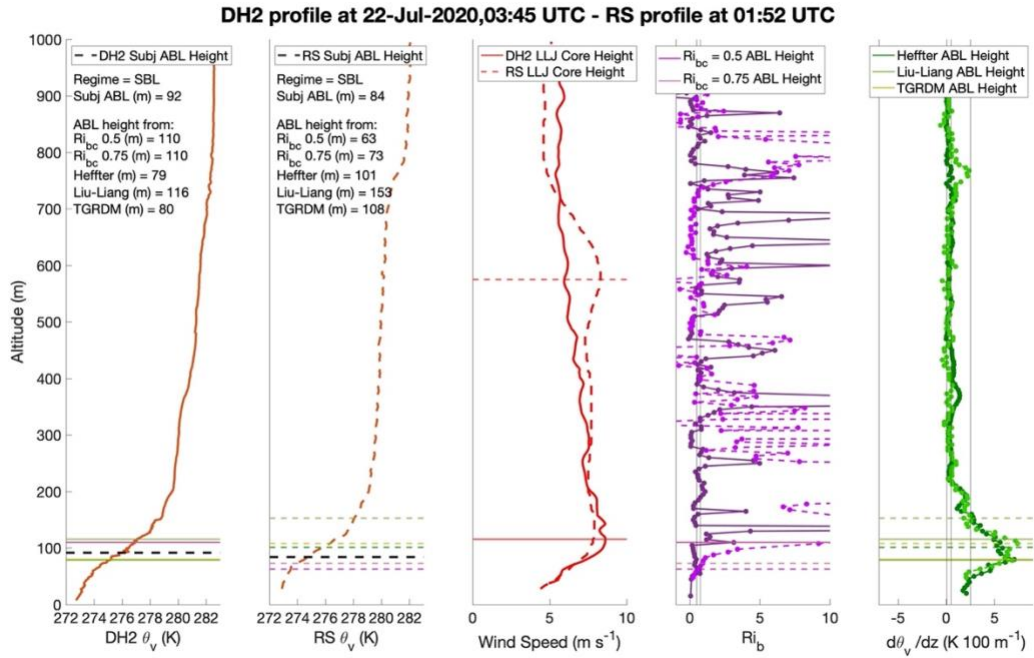
Figure S57: ABL height identification for DH2 flight on 22 July at 3:45 UTC and radiosonde profile at 1:52 UTC.
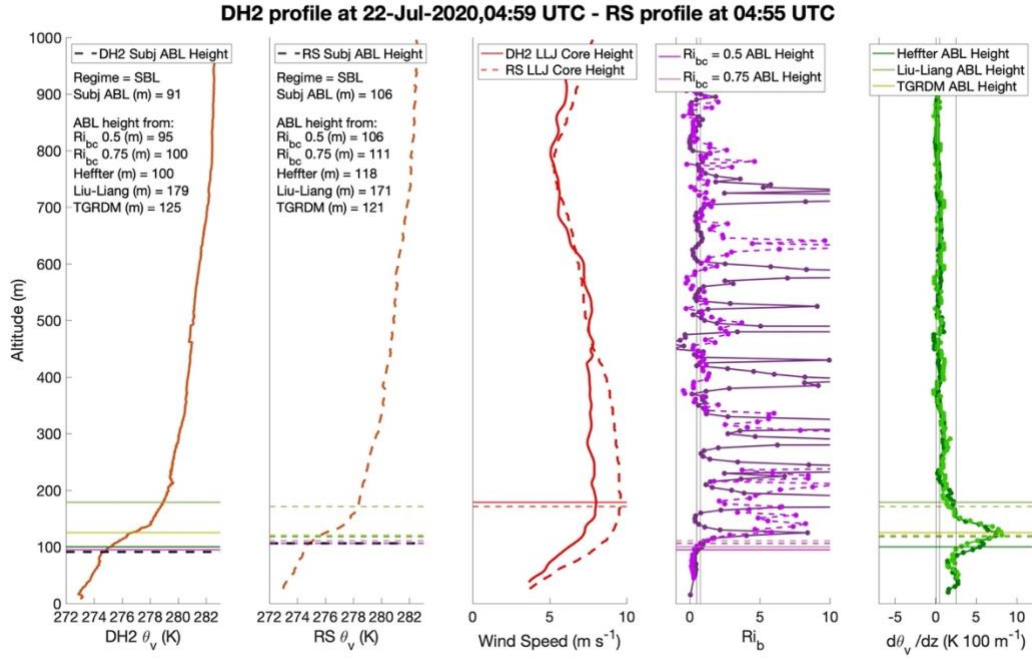
Figure S58: ABL height identification for DH2 flight on 22 July at 4:59 UTC and radiosonde profile at 4:55 UTC.
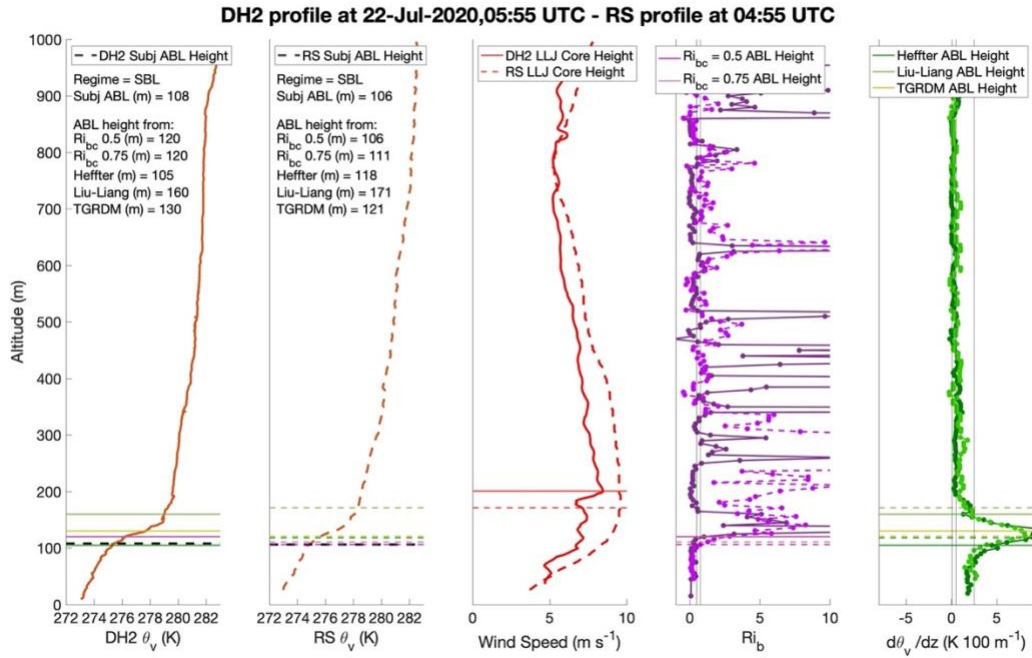
Figure S59: ABL height identification for DH2 flight on 22 July at 5:55 UTC and radiosonde profile at 4:55 UTC.
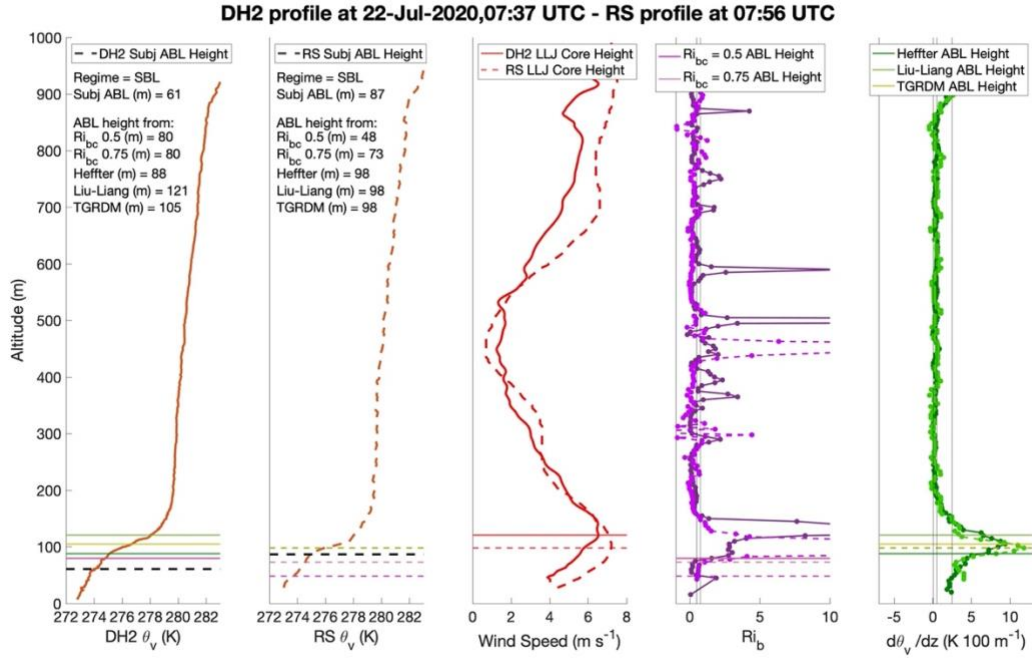
Figure S60: ABL height identification for DH2 flight on 22 July at 7:37 UTC and radiosonde profile at 7:56 UTC.
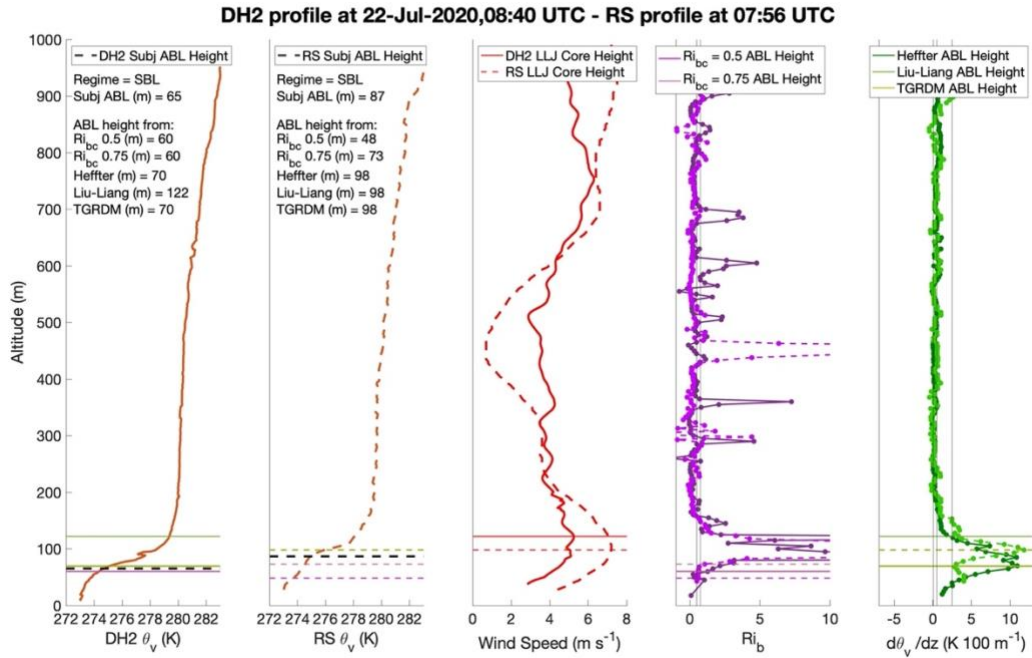
Figure S61: ABL height identification for DH2 flight on 22 July at 8:40 UTC and radiosonde profile at 7:56 UTC.
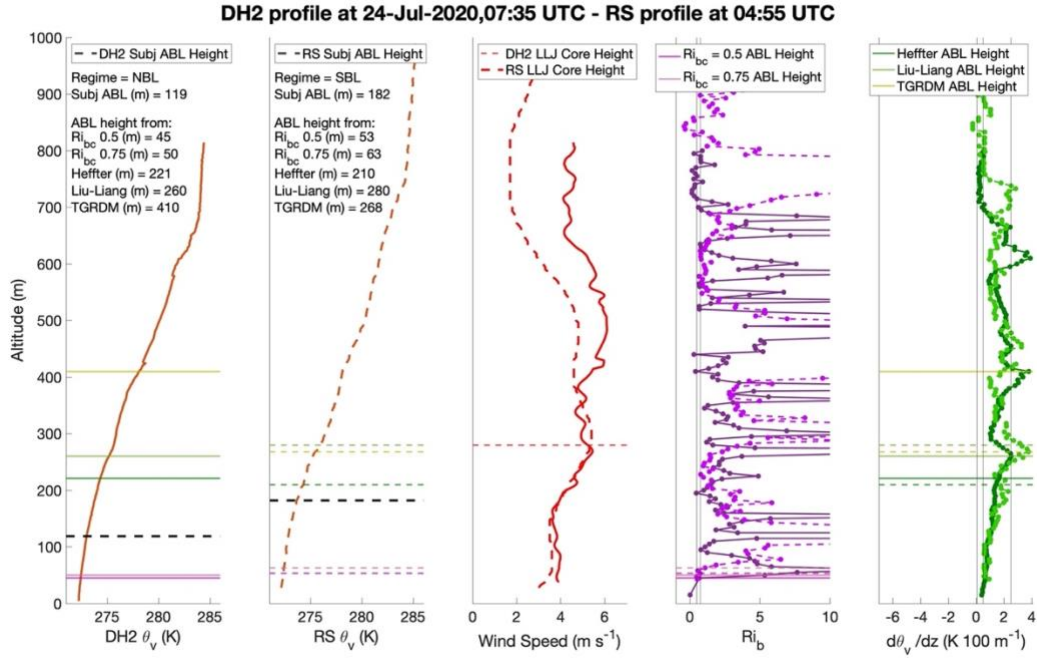
Figure S62: ABL height identification for DH2 flight on 24 July at 7:35 UTC and radiosonde profile at 4:55 UTC.
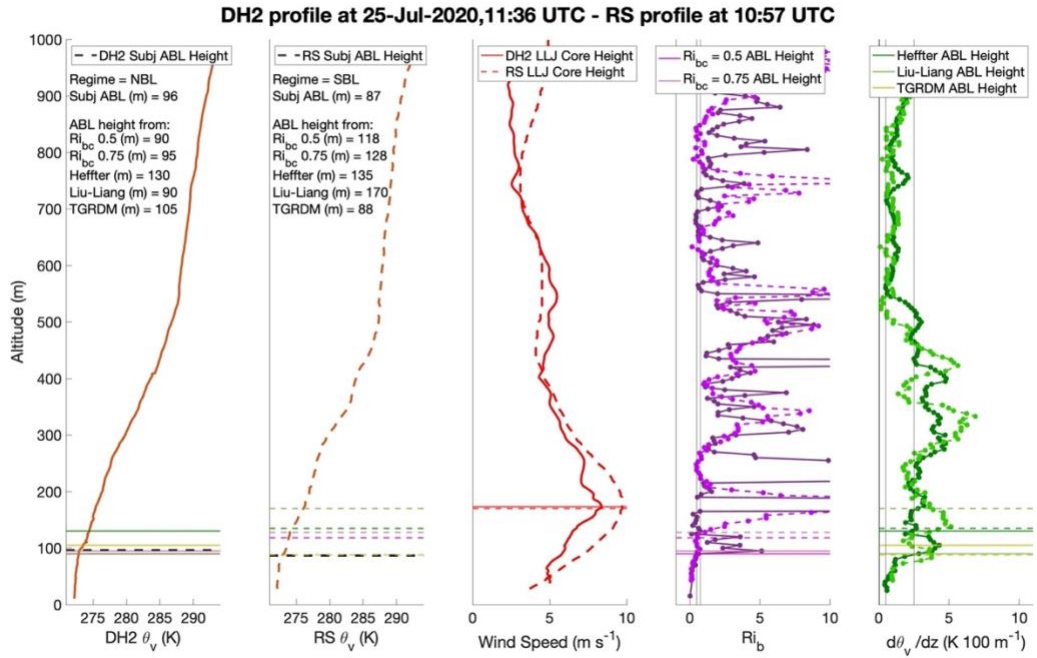
Figure S63: ABL height identification for DH2 flight on 25 July at 11:36 UTC and radiosonde profile at 10:57 UTC.
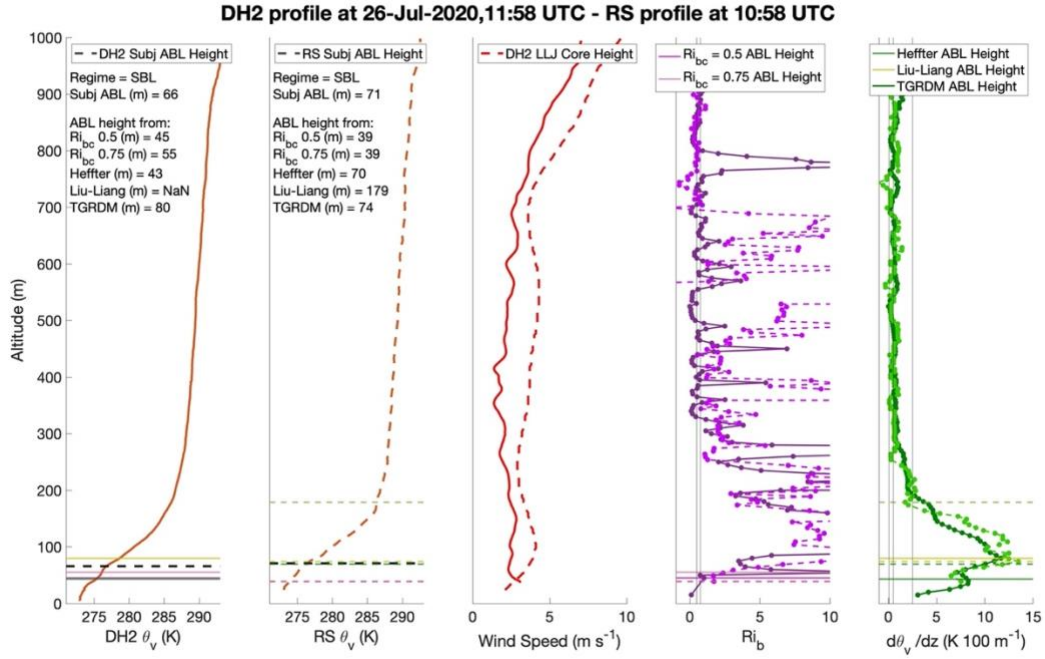
Figure S64: ABL height identification for DH2 flight on 26 July at 11:58 UTC and radiosonde profile at 10:58 UTC.
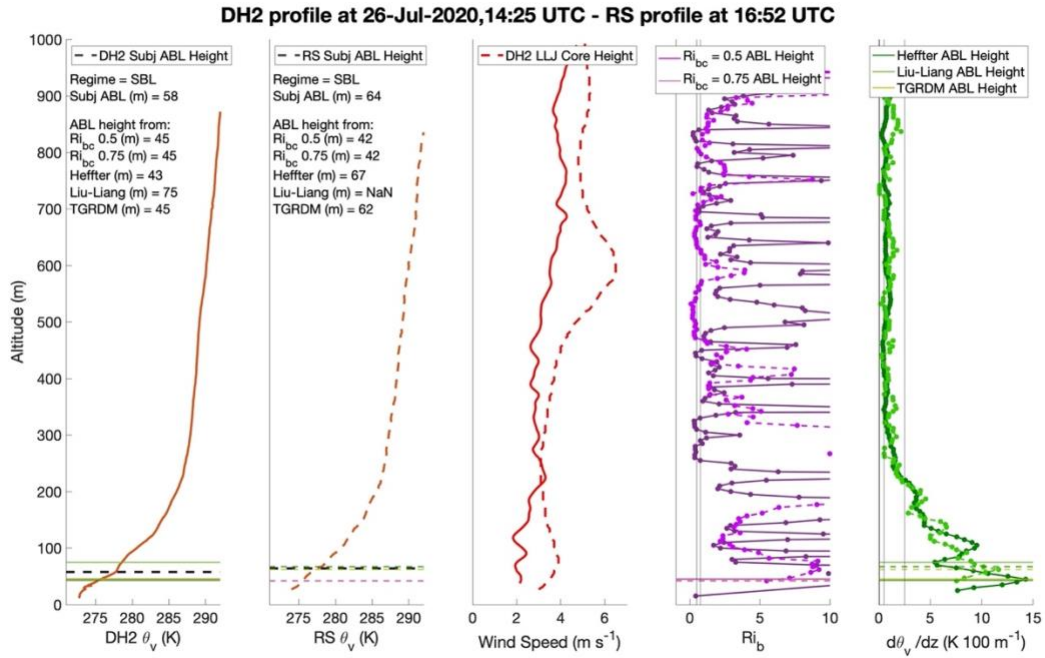
Figure S65: ABL height identification for DH2 flight on 26 July at 14:25 UTC and radiosonde profile at 16:52 UTC.