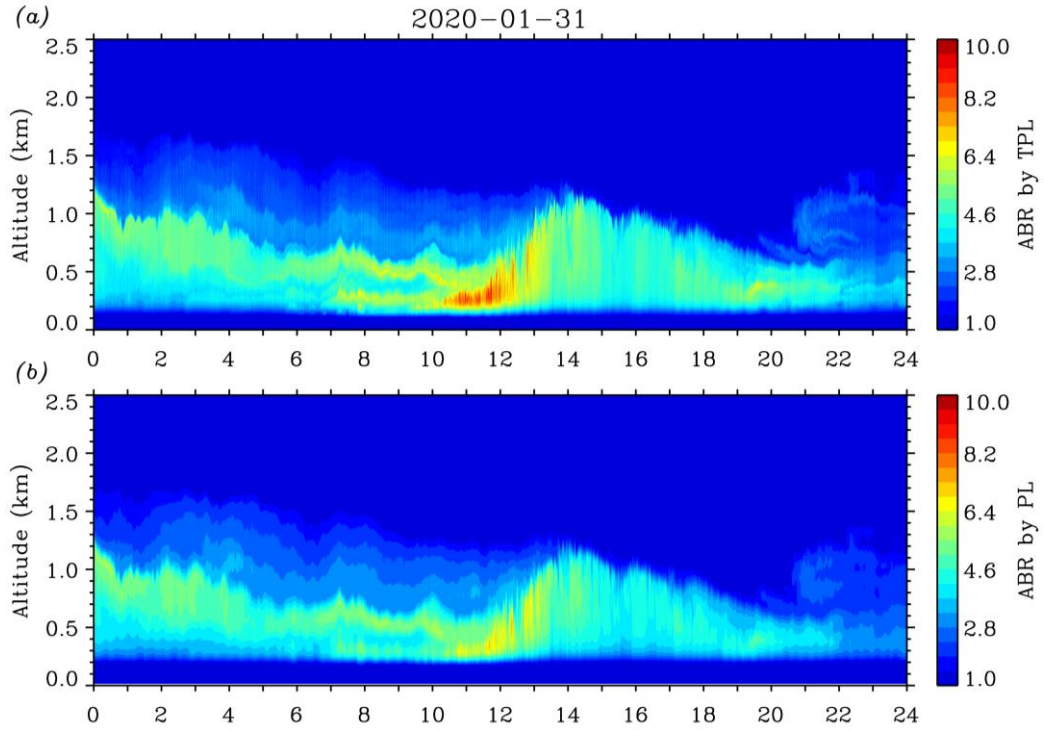


*Supplement of*

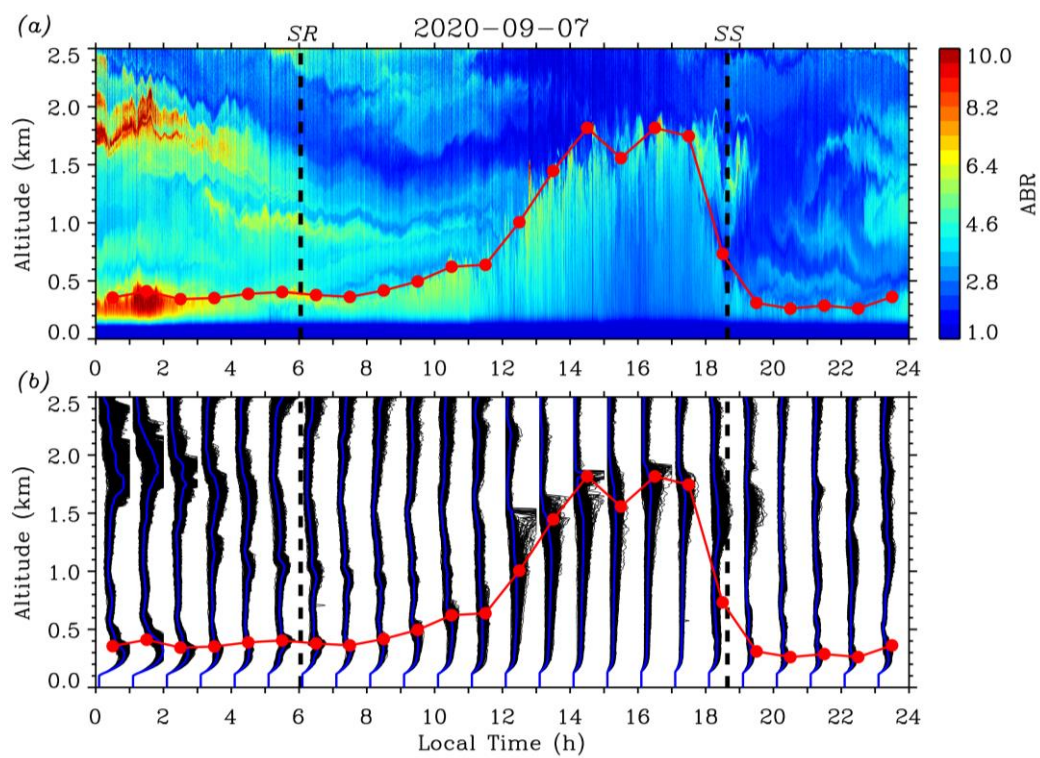
**Measurement report: Characteristics of clear-day convective boundary layer and associated entrainment zone as observed by a ground-based polarization lidar over Wuhan (30.5° N, 114.4° E)**

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**Figure S1: Contour plots of ABR results obtained by (a) the TPL in this work and (b) another co-located vertically-pointing 532-nm PL (Kong and Yi, 2015) on January 31, 2020. The TPL has 10-s temporal and 6.5-m spatial resolution, while the PL has 60-s temporal and 30-m spatial resolution. The two lidars have a horizontal range of ~15 m apart. Note the concurrent ABR results by these two lidars generally had nearly identical structures and comparable magnitudes in the ABL region.**



**Figure S2:** Same as Figure 4 but on the day of September 7, 2020.

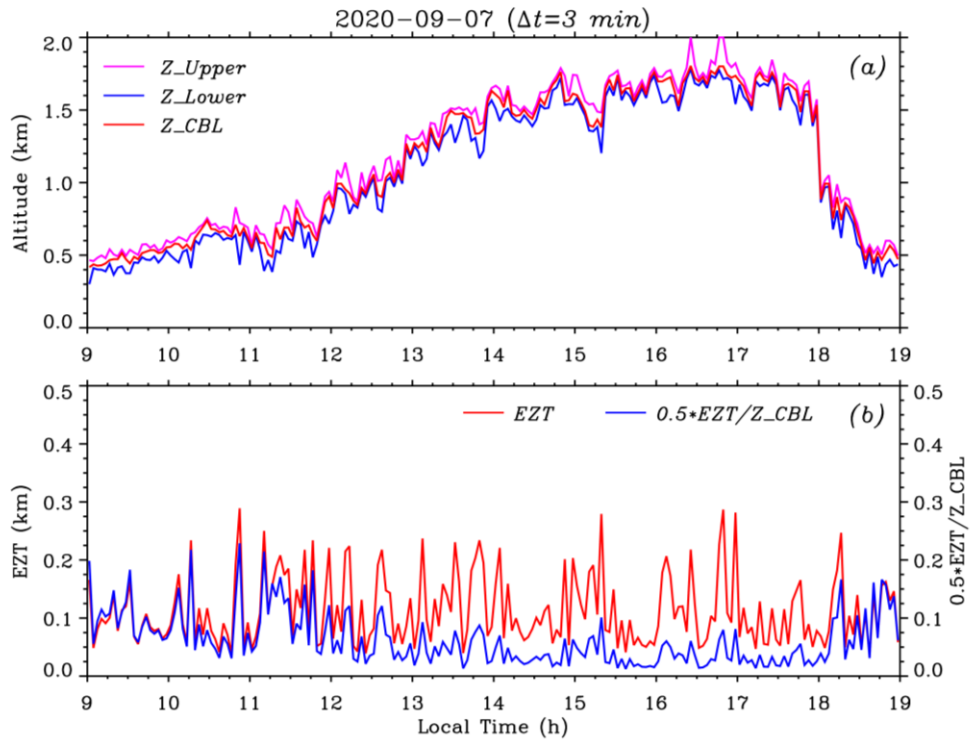
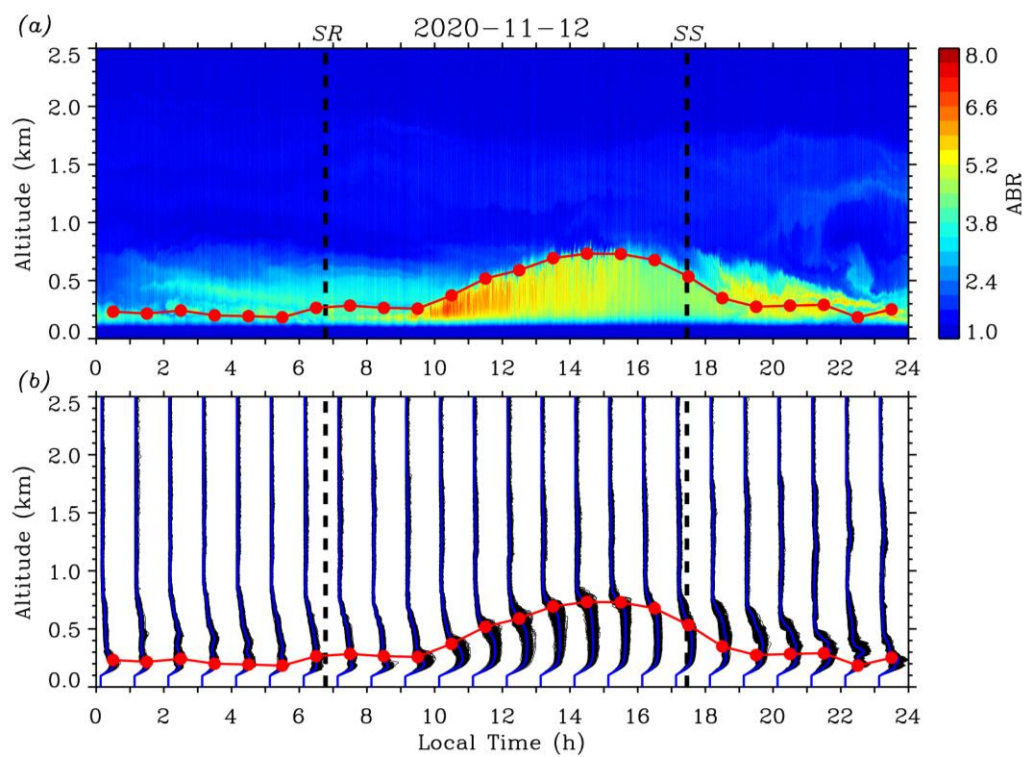


Figure S3: Same as Figure 6 but on the day of September 7, 2020.

**Table S1: Statistics of EZT obtained on September 7, 2020**

Stage of CBL		Formation	Growth	Quasi-stationary	Decay	Total
Time Interval (LT)		0900-1130	1130-1430	1430-1630	1630-1900	0900-1900
Statistical data of EZT(km)	<i>min</i>	0.039	0.039	0.041	0.034	0.034
	<i>max</i>	0.289	0.237	0.279	0.287	0.289
	<i>mean</i>	0.111	0.123	0.113	0.106	0.113
	<i>stddev</i>	0.058	0.062	0.057	0.060	0.060
Percentages	0.00-0.05 km	10.0	6.7	5.0	10.0	8.0
in each EZT subrange	0.05-0.10 km	46.0	45.0	47.5	44.0	45.5
	0.10-0.15 km	20.0	18.3	22.5	30.0	22.5
(%)	0.15-0.20 km	16.0	11.7	12.5	8.0	12.0
	0.20-0.30 km	8.0	18.3	12.5	8.0	12.0



**Figure S4:** Same as Figure 4 but on the day of November 12, 2020.

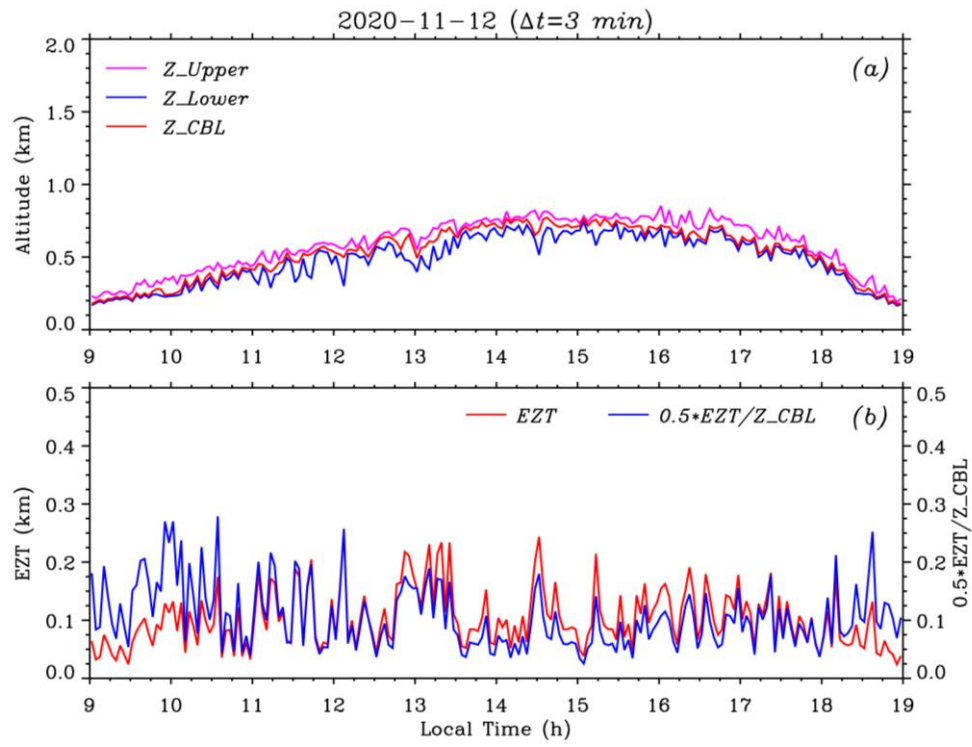


Figure S5: Same as Figure 6 but on the day of November 12, 2020.

**Table S2: Statistics of EZT obtained on November 12, 2020**

Stage of CBL		Formation	Growth	Quasi-stationary	Decay	Total
Time Interval (LT)		0900-1130	1130-1430	1430-1630	1630-1900	0900-1900
Statistical data of EZT(km)	<i>min</i>	0.024	0.043	0.039	0.024	0.024
	<i>max</i>	0.182	0.257	0.244	0.182	0.257
	<i>mean</i>	0.084	0.133	0.106	0.092	0.103
	<i>stddev</i>	0.041	0.062	0.040	0.042	0.050
Percentages	0.00-0.05 km	22.0	5.0	5.0	14.0	11.5
in each	0.05-0.10 km	48.0	30.0	48.3	46.0	44.0
EZT	0.10-0.15 km	22.0	22.5	28.3	32.0	26.5
subrange	0.15-0.20 km	8.0	22.5	13.4	8.0	12.5
(%)	0.20-0.26 km	0.0	20.0	5.0	0.0	5.5

**Table S3: Surface temperature magnitude ranges for each month and the four typical days in 2020 over Wuhan (30.5 °N, 114.4 °E)**

Month	Surface temperature magnitude range
January	-1-13 °C (0-13 °C for January 31, 2020; <b>Case 1</b> )
February	0-25 °C
March	3-27 °C
April	5-30 °C
May	11-35 °C (18-29 °C for May 19, 2020; <b>Case 2</b> )
June	21-34 °C
July	21-34 °C
August	20-37 °C
September	15-34 °C (21-34 °C for September 7, 2020; <b>Case 3</b> )
October	9-26 °C
November	1-24 °C (7-22 °C for November 12, 2020; <b>Case 4</b> )
December	-6-16 °C