

Supplement of

Concentration, temporal variation and sources of black carbon in the Mount Everest region retrieved by real-time observation and simulation

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Table S1. Mean BC concentration at QOMS and compared with other remote sites.

Name	Location	Sample	Sampling period	BC or EC (ng/m ³)	Reference
QOMS	Southern TP (28.36°N, 86.95°E, 4276m)	AE-33	May 2015-May 2017	298.8 ± 341.3	This paper
QOMS	Southern TP (28.36°N, 86.95°E, 4276m)	TSP	Aug 2009-Jul 2010	250 ± 220	Cong et al. (2015a)
Lhasa	Southern TP (29.65°N, 91.03°E, 3642m)	PM ₁₀	May 2013-Mar 2014	2310	Li et al. (2016b)
Ranwu	Southeast TP (29.32°N, 96.96°E, 4600m)	AE-31	Nov 2012-Jun 2013	139.1	Wang et al. (2016)
Nam Co	Central TP (30.77°N, 90.98°E, 4730m)	TSP	Jan-Dec 2012	190	Wan et al. (2015)
Qilian Shan	Northern TP (39.50°N, 96.50°E, 4214m)	AE-31	May 2009-Mar 2011	48	Zhao et al. (2012)
Beiluhe	Northern TP (34.85°N, 92.94°E, 4600m)	AE-31	Nov 2012-Jun 2013	413.2	Wang et al. (2016)
Qinghai Lake	Northeast TP (37.00°N, 99.90°E, 3200m)	PM _{2.5}	Jul-Aug 2010	370	Li et al. (2013)
Muztagh Ata	Northwest TP (38.29°N, 75.02°E, 4500m)	TSP	Dec 2003-Feb 2006	55	Cao et al. (2009)
Manora Peak, India	Central Himalayas (29.40° N, 79.50° E, 1950m)	TSP	Feb 2005–Jul 2008	In the range of 140-7600	Ram et al. (2010)
NCO-P, Nepal	Southern Himalayas (27.95°N, 86.82°E, 5079m)	PM ₁	Mar 2006-Feb 2008	160.5 ±296.1	Marinoni et al. (2010)

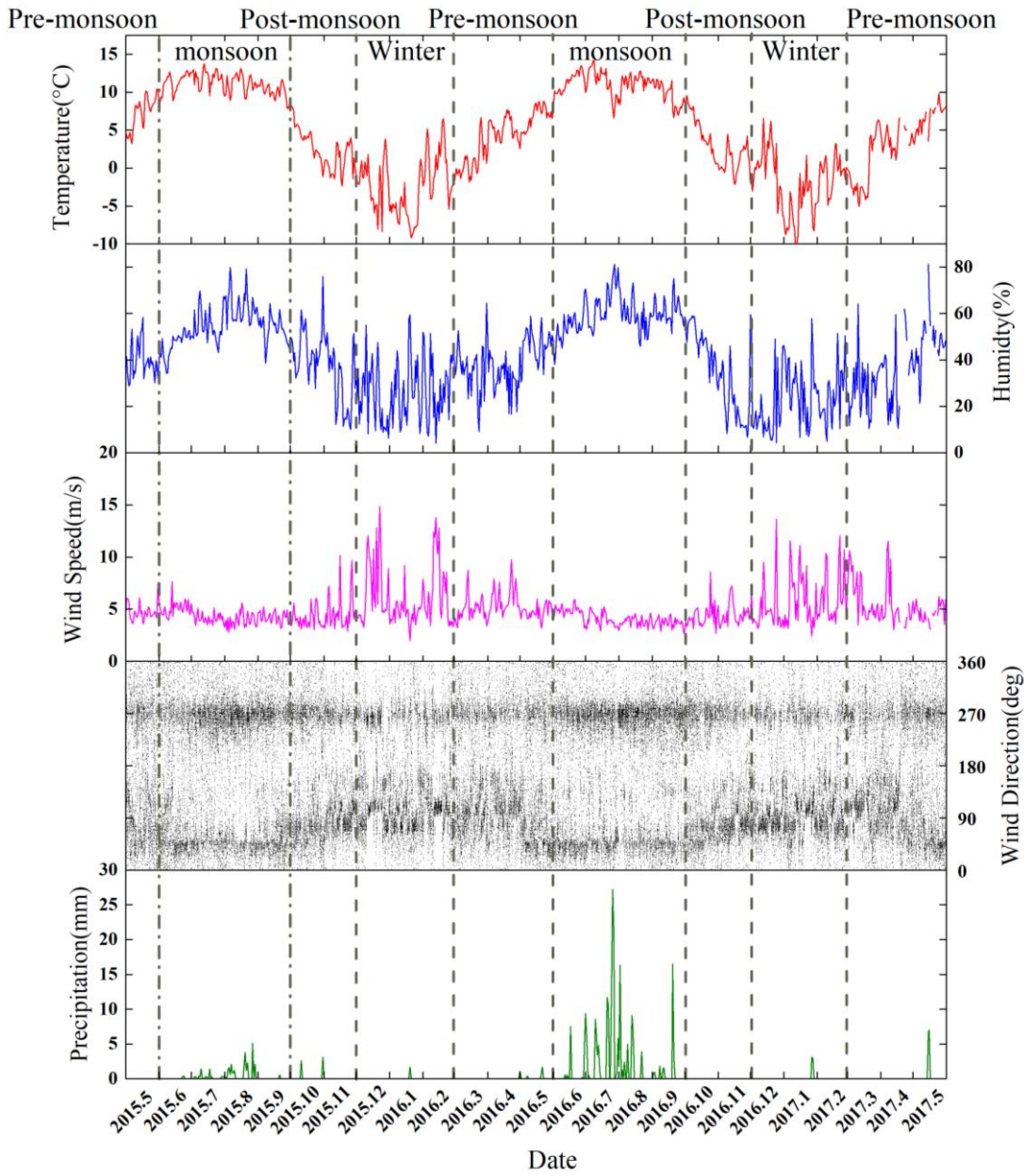


Figure S1. Variations of temperature, humidity, wind speed, wind direction, and precipitation at QOMS from May 2015 to May 2017.

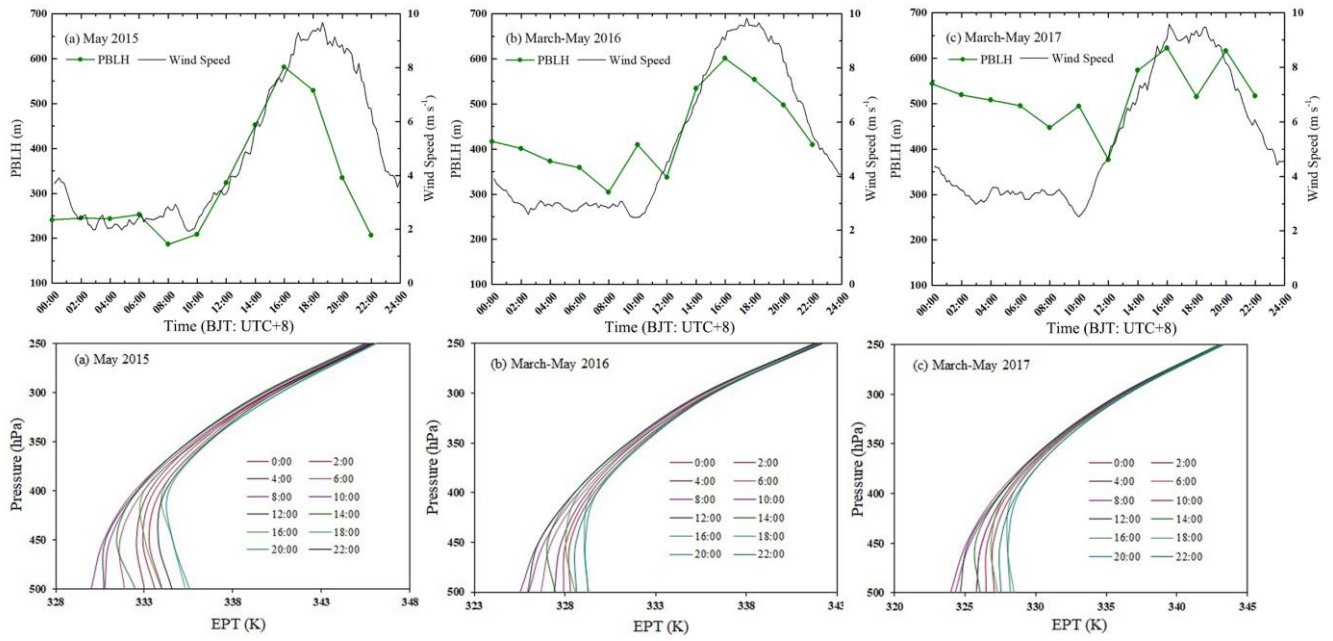
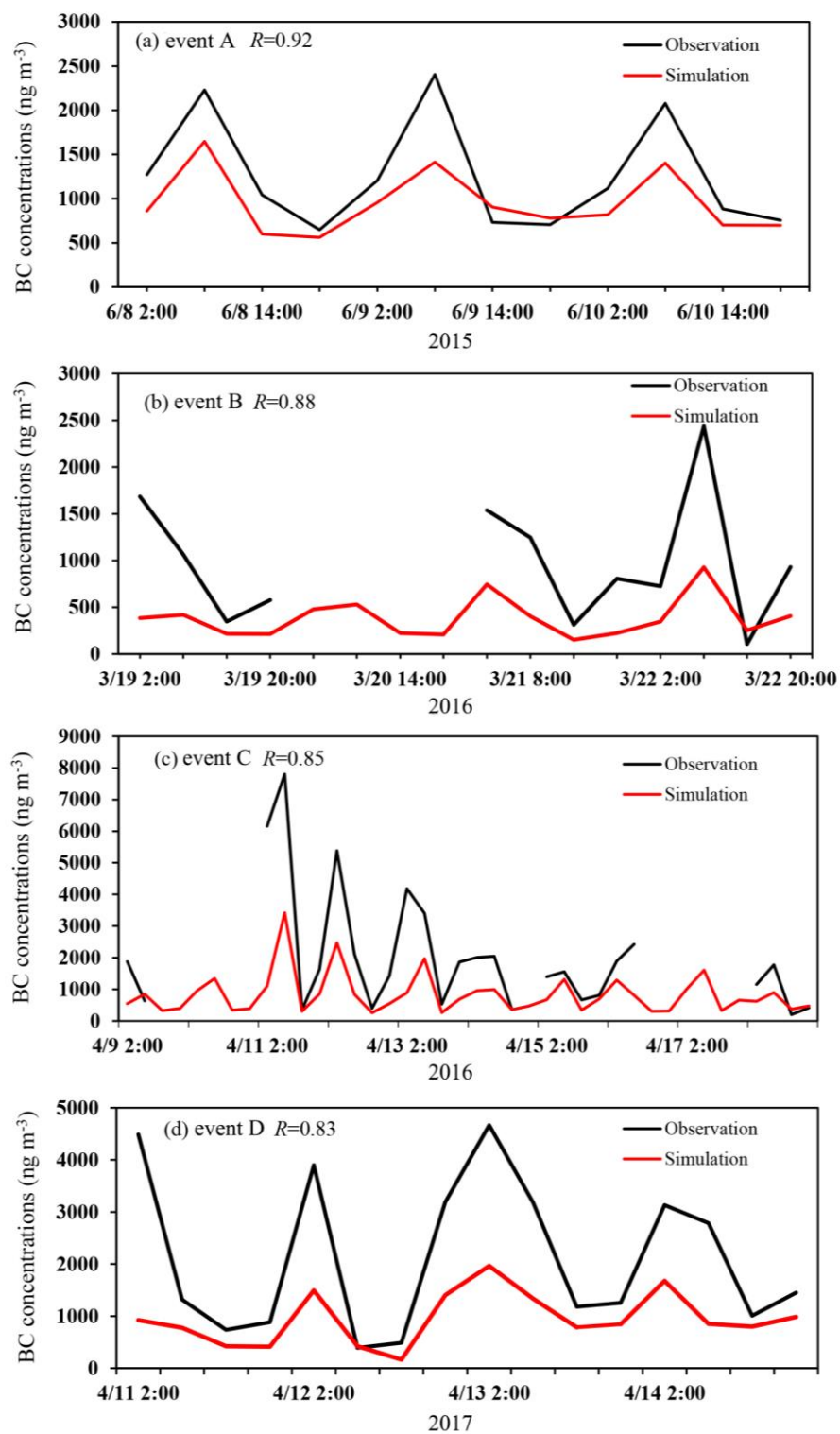
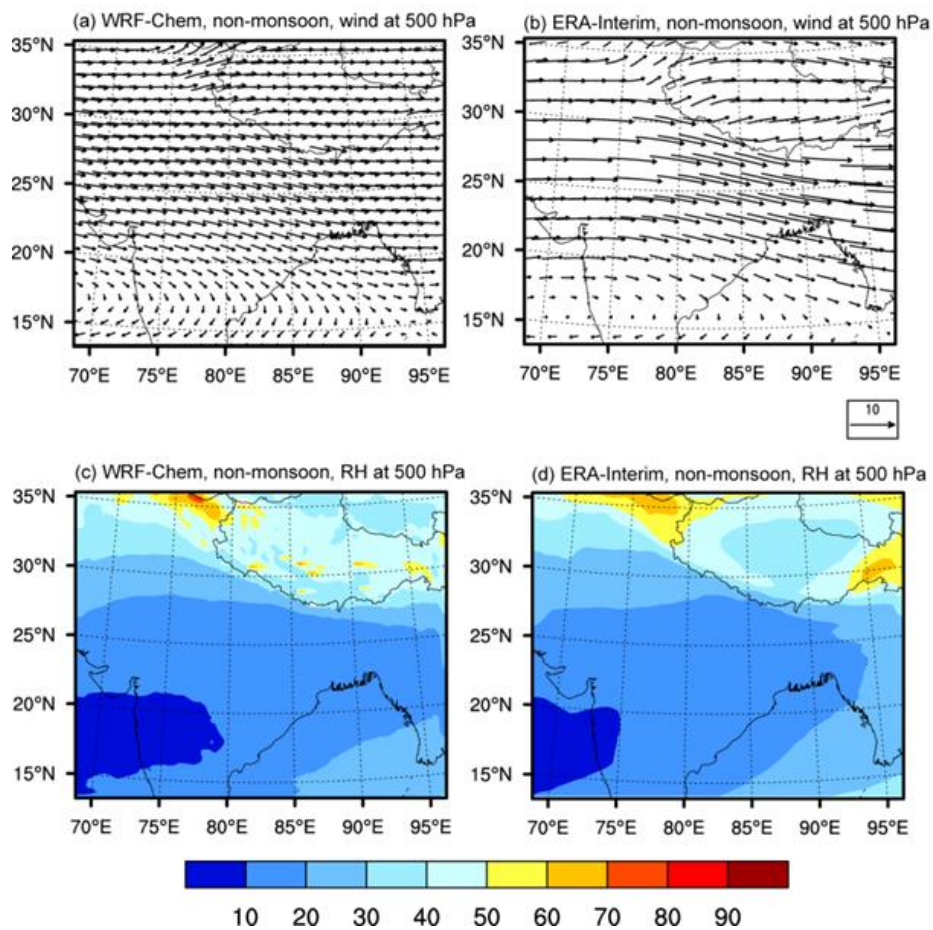


Figure S2. Diurnal variation in planetary boundary layer height (the first row) and the vertical profile of distribution of equivalent potential temperature (the second row) at QOMS in the pre-monsoon season.



25 **Figure S3. Comparisons between simulated BC concentrations and the observations at QOMS during the four pollution episodes: (a) event A, (b) event B, (c) event C, and (d) event D**



30 **Figure S4. Mean wind (m s^{-1}) and relative humidity (RH, %) at 500 hPa during the non-monsoon seasons from the WRF-Chem simulation (a, c) and the ERA-Interim (b, d), respectively.**

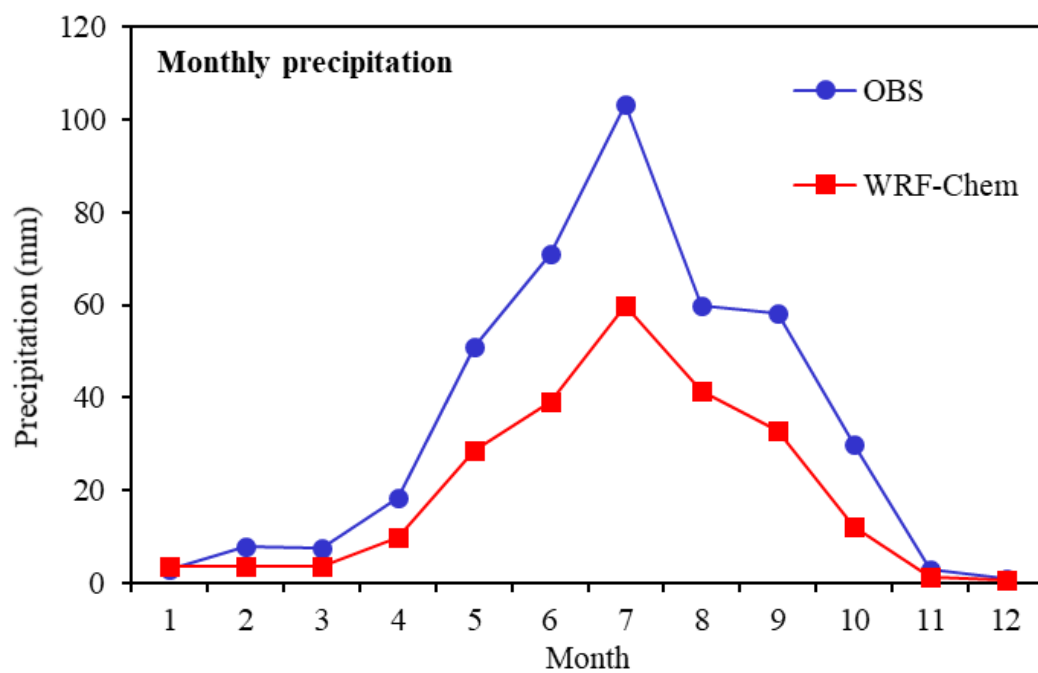


Figure S5. Monthly mean precipitation in 2013, averaged at 73 sites over the TP. Data are from the observations at national stations (OBS) and the model simulation in this study (WRF-Chem).

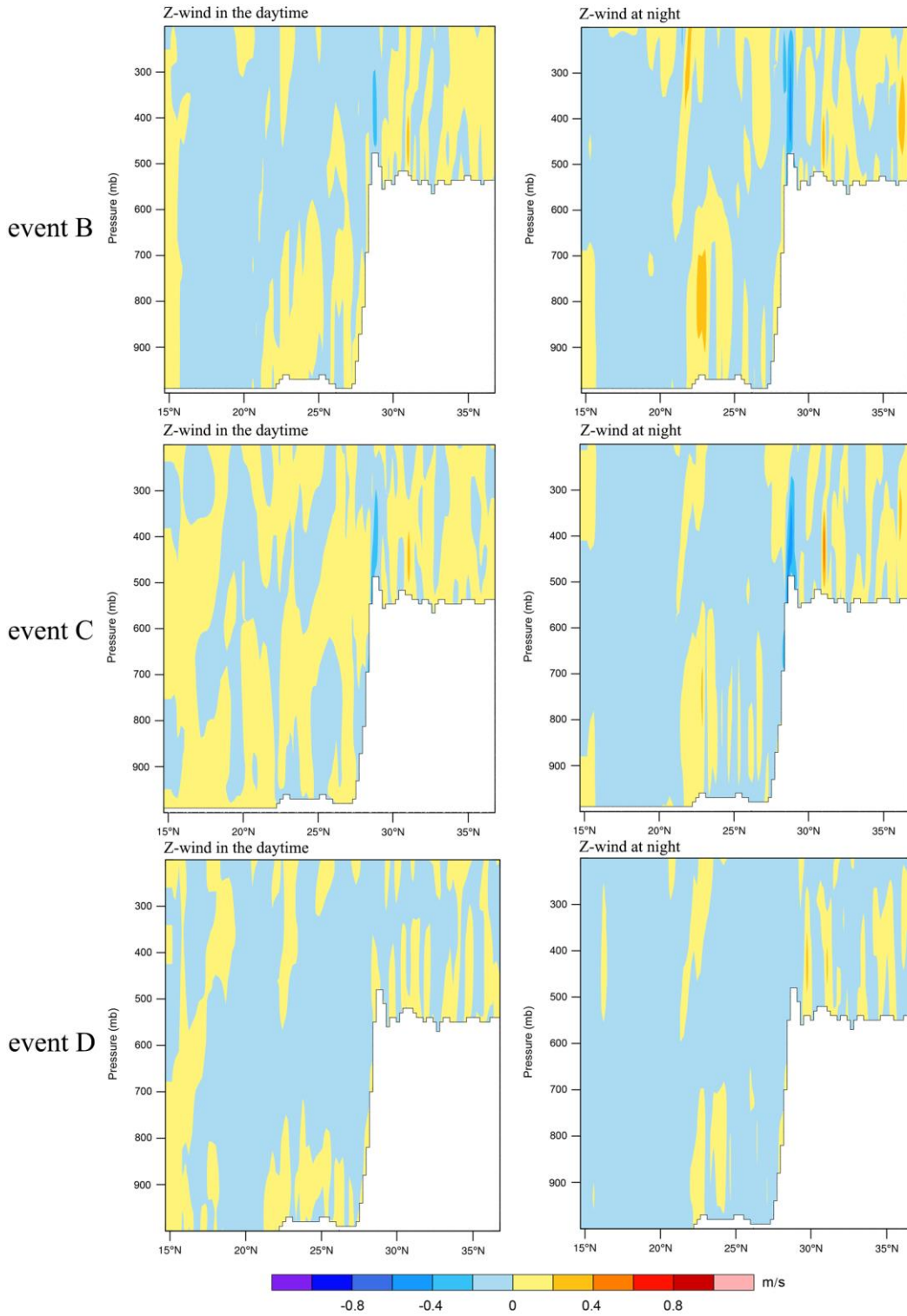


Figure S6. Vertical profile of mean wind at QOMS and its vicinities in the daytime and at night: event B (the first row), event C (the second row) and event D (the last row).