

**Supplement**

effective cloud fractions (eCF) x	Number of days and date
0 < x ≤ 0.1	Number of days: 29 (October 3, 5, 11, 12, 13, 15, 16, 23; November 2, 3, 12, 13, 14; December 1, 3, 4, 5, 7, 9, 10, 11, 14, 15, 16, 21, 24, 25, 29, 30)
0.1 < x ≤ 0.3	Number of days: 10 (October 6, 17, 21, 22, 27; November 22, 27; December 1, 20, 31)
0.3 < x ≤ 0.7	Number of days: 23 (October 2, 7, 14, 18, 28; November 1, 4, 5, 8, 9, 10, 18, 23, 25, 30; December 2, 6, 12, 17, 19, 22, 23, 28)
0.7 < x ≤ 1	Number of days: 30 (October 1, 4, 8, 9, 10, 19, 20, 24, 25, 26, 29, 30, 31; November 6, 7, 11, 15, 16, 17, 19, 20, 21, 24, 26, 29; December 8, 13, 18, 26, 27)

**Table S1: Number of days and dates corresponding to different effective cloud fractions from October 1, 2014 to December 31, 2014.**

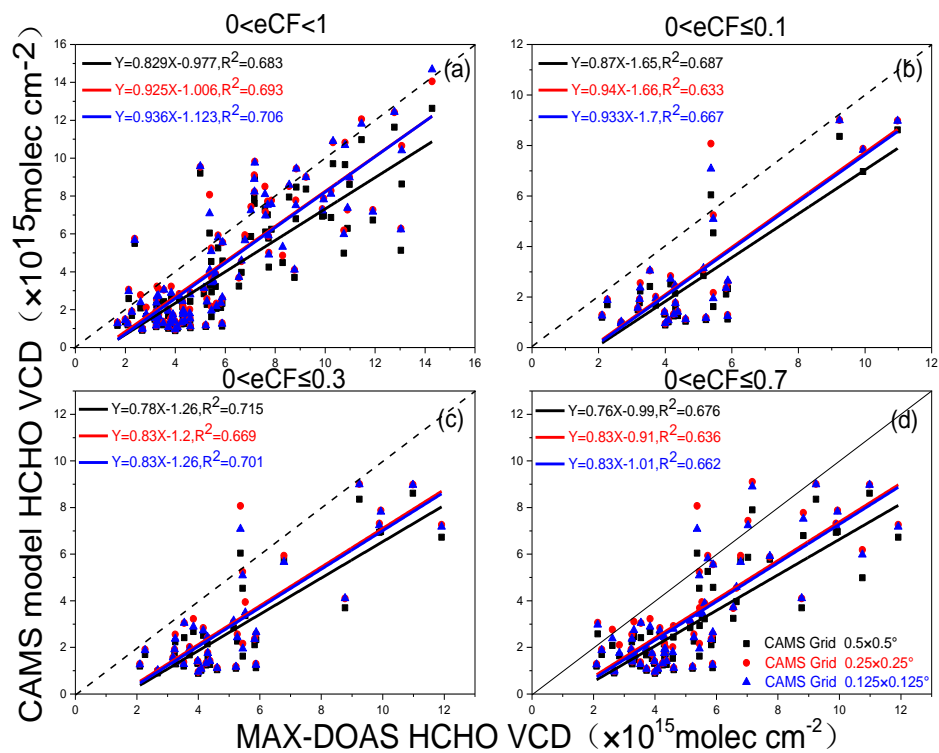


Figure S1: Correlation between HCHO VCDs retrieved from the MAX-DOAS measurements and those obtained from the CAMS model data for  $0 < eCF \leq 1$  (a),  $0 < eCF \leq 0.1$  (b),  $0 < eCF \leq 0.3$  (c), and  $0 < eCF \leq 0.7$  (d) at 8:00 LT from October to December 2014.

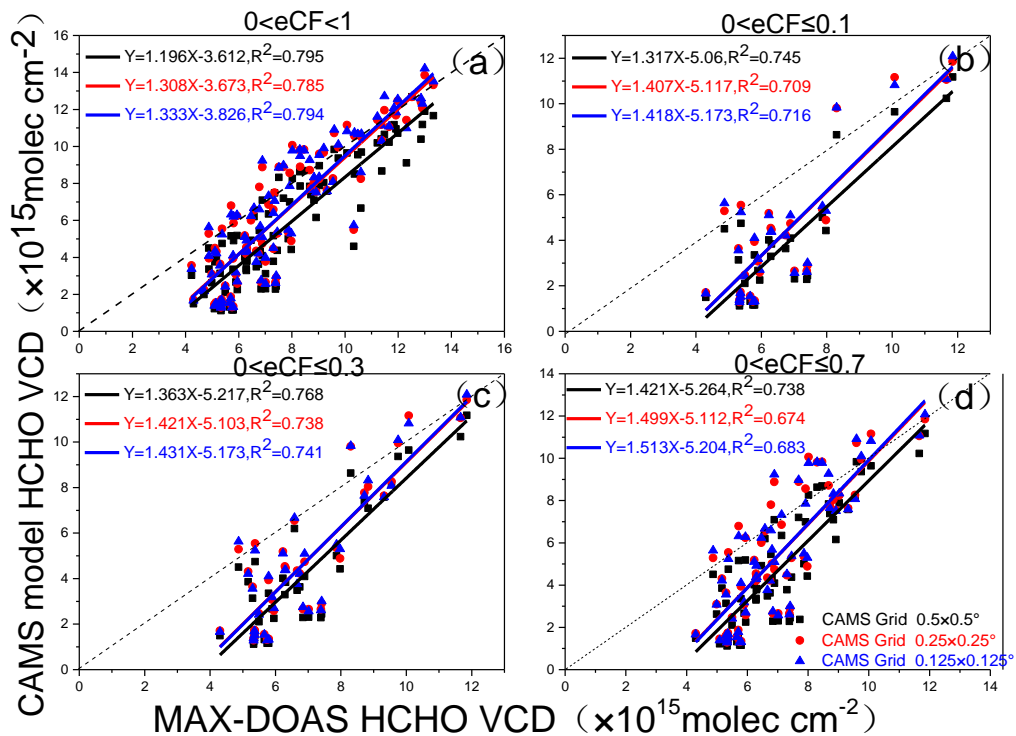


Figure S2: Correlation between HCHO VCDs retrieved from the MAX-DOAS measurements and those obtained from the CAMS model for  $0 < eCF \leq 1$  (a),  $0 < eCF \leq 0.1$  (b),  $0 < eCF \leq 0.3$  (c), and  $0 < eCF \leq 0.7$  (d) at 14:00 LT from October to December 2014.