Geophysical Research Abstracts
Vol. 15, EGU2013-6924, 2013
EGU General Assembly 2013

Analysis of CO_2 Diurnal Cycle in Boundary Layer over China - Observations and Modeling

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A 3-D global CTM (Chemical Transport Model) GEOS-Chem, driven by GEOS-5 meteorology fields, has been used to simulate CO_2 concentration and variation over China from 2004 to 2009 in this study. We analyze CO_2 concentration observed by two eddy flux observation towers in Beijing (39.9°N, 116.3°E) and Hefei (31.9°N, 117.3°E). GEOS-Chem well captures the main aspects of the diurnal cycle of CO_2 concentration in boundary layer observed in Beijing and Hefei. However, we still find some discrepancies existing between the model and observations, where model tends to overestimate CO_2 concentration. On the other hand, model sensitivity studies suggest that Net Ecosystem Productivity (NEP) flux may play an important role controlling the diurnal cycle of CO_2 in boundary layer.