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The Influence of Long-range Transport Asian Biomass Burning on CO and O3 mixing ratios in Taiwan

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Carbon monoxide (CO) and ozone (O3) mixing ratios were observed from 30 January to 7 April 2008 at Mt. Lulin (23.28[U+F0B0]N, 120.52[U+F0B0]E, 2862 m above sea level, asl) in central Taiwan to investigate the influence of Asian biomass burning on the concentrations of both pollutants in springtime. During the sampling campaign, the average mixing ratios of CO and O3 were, respectively, 233 [U+F0B1] 63 and 47 [U+F0B1] 12 ppb with higher levels observed in March. The elevated CO and O3 in March were attributed to biomass burning activities in the Southeast (SE) Asian continent on the basis of backward trajectories and satellite fire spots analyses. Backward trajectory analysis showed that air masses mainly originated from the India (ID), the Indochina Peninsula (IP) and South Coastal China (SC), which together accounted for 85 % of the total trajectories. The higher mixing ratios of both CO and O3 were found in the ID, IP and SC categories, indicating the significant impacts of anthropogenic emissions from SE Asia. O3 and CO showed strong positive correlations in the polluted ID, IP and SC air masses, suggesting that a significant photochemistry of ozone production from the anthropogenic emissions was found in the polluted region. Furthermore, the air parcels were divided into two categories, including those that passed over the fire regions (PF) and those that did not (NP). The average difference of CO and O3 levels between the two categories was approximately 81 and 10 ppb, suggesting that the Asian biomass burning plays an important role in CO and O3 levels at the remote site during the springtime.