

[EJ] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-AS Atmospheric Sciences, Meteorology & Atmospheric Environment

[A-AS06]Atmospheric Chemistry

convener:Yoko Iwamoto(Graduate School of Biosphere Science, Hiroshima University), Tomoki Nakayama(Graduate School of Fisheries and Environmental Sciences, Nagasaki University), Sakae Toyoda(東京工業大学物質理工学院, 共同), Nawo Eguchi(Kyushu University)

Wed. May 23, 2018 5:15 PM - 6:30 PM Poster Hall (International Exhibition Hall7, Makuhari Messe)

This session provides a forum for the presentation of the broad spectrum of tropospheric and stratospheric chemistry, including various research topics (e.g., dynamical processes, air quality and climate), approaches (modeling, field measurements, remote sensing, and laboratory studies), and species (gas and aerosol). This session also provides an opportunity for discussing possible future collaboration with other research fields relevant to atmospheric chemistry.

[AAS06-P04]Analysis of variation in atmospheric CO₂ and CO concentrations emitted from biomass burning using GOSAT/TANSO-FTS and MOPITT data

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Keywords:biomass burning, GOSAT, carbon dioxide, MOPITT, carbon monoxide

This study has focused on Africa, where biomass burning occurs frequently, and studied the relationship between carbon monoxide (CO) and carbon dioxide (CO₂) concentrations emitted due to the biomass burning by using CO₂ vertical profiles (Version 1) from the thermal infrared (TIR) band of Thermal and Near infrared Sensor for Carbon Observation Fourier Transform Spectrometer (TANSO-FTS) on board Greenhouse Gases Observing Satellite (GOSAT) [Saitoh et al., 2016] and CO vertical profiles (Version 6) retrieved from the combined use of the TIR and near infrared (NIR) bands of Measurement Of Pollution In The Troposphere (MOPITT) [Deeter et al., 2014].

In the latitude region around 10°N over Africa, TANSO-FTS CO₂ concentrations at 200-300 hPa were 2 ppm higher than a priori CO₂ concentrations taken from NIES-TM05 model [Saeki et al., 2013] from December to February when active biomass burning events occurred frequently. We have compared monthly-averaged CO data from the MOPITT TIR/NIR bands with monthly-averaged detrending CO₂ data from the TANSO-FTS TIR band at 200-300 hPa in the northern low latitudes over Africa. The comparison result showed that both TANSO-FTS CO₂ and MOPITT CO concentrations became higher at around the same time to each other. The periods of increase in the observed CO₂ and CO concentrations were in January-March and in February-April, respectively, which slightly shifted from the periods of increase in their a priori concentrations. The amounts of the observed increase were larger compared to their a priori concentrations. MOPITT CO concentrations were clearly higher in the lower troposphere from December to January and in the upper troposphere from February to March, whereas they did not show any increasing trend. We have also analyzed the backward trajectories of air masses with high CO and CO₂ concentrations observed by the GOSAT/TANSO-FTS TIR band and the MOPITT NIR/TIR bands to examine their sources.