

# Analysis of variation in atmospheric CO<sub>2</sub> and CO concentrations emitted from biomass burning using GOSAT/TANSO-FTS and MOPITT data

\*Shingo Kosaka<sup>1</sup>, Naoko Saitoh<sup>2</sup>

1. Chiba University Graduate School of Science and Engineering, 2. Center of Environmental Remote Sensing, Chiba University

This study has focused on Africa, where biomass burning occurs frequently, and studied the relationship between carbon monoxide (CO) and carbon dioxide (CO<sub>2</sub>) concentrations emitted due to the biomass burning by using CO<sub>2</sub> 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 CO<sub>2</sub> concentrations at 200-300 hPa were 2 ppm higher than a priori CO<sub>2</sub> 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 CO<sub>2</sub> 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 CO<sub>2</sub> and MOPITT CO concentrations became higher at around the same time to each other. The periods of increase in the observed CO<sub>2</sub> 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 CO<sub>2</sub> concentrations observed by the GOSAT/TANSO-FTS TIR band and the MOPITT NIR/TIR bands to examine their sources.

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