Proportion of atmospheric methane to carbon dioxide observed by GOSAT over biomass burning regions in Africa

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Multi-species satellite measurements in important biomass burning regions are expected for better understanding the partitioning of reduced gas production (van der Werf, 2010). In this study, we utilized the data of atmospheric concentration of carbon dioxide (CO2) and methane (CH4) observed by Thermal And Near-infrared Sensor for carbon Observation (TANSO)-FTS onboard Greenhouse Gases Observing Satellite (GOSAT) to derive the ratios of the two species over the active biomass burning regions in Africa. Contribution of fire emission from Africa to the global carbon fire emissions is estimated as 52% by van der Werf (2010). It is well recognized that in Northern Hemisphere Africa (NHA), fires occur primarily in the Sahel between November and February. On the other hand, in Southern Hemisphere Africa (SHA), fires are prominent primarily between June and October (e.g., Roberts, et al. 2009). We investigated the proportions of CH4 to CO2 focusing on regions and seasonality and found the proportion of CH4 to CO2 during the burning season over NHA is higher than that in SHA. In addition to CH4 and CO2, we are going to show the results of combined analysis with carbon monoxide (CO) observed by Measurements Of Pollution In The Troposphere (MOPITT), and discuss potential of satellite sensors to characterize biomass burning.
References
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van der Werf et al. (2010): ACP, 10, 11707-11735.

Keywords: carbon cycle, biomass burning, GOSAT

