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New simple approach to understand the spatial and vertical distribution of biomass burning CO emission based on the MOPITT vertical measurements

Chuyong Lin and Jason Cohen

Sun Yat-Sen University, School of atmospheric sciences, School of atmospheric sciences, Guangzhou, China
(linchuyong@hotmail.com)

A simple variance-maximization approach, based on 19 years of weekly Moderate Resolution Imaging spectroradiometer (MOPITT) CO vertical measurements, was employed to quantify the spatial distribution of the global seasonal biomass burning region. Results demonstrate there are a few large-scale and typical biomass burning regions responsible for most of the biomass burning emissions throughout the world, with the largest of these such regions located in Amazonian South America, Western Africa, Indonesia, and Northern Southeast Asia (Eastern India, Northern Myanmar, Laos, Vietnam and Eastern Bangladesh), which are highly associated with the results of Global Fire Emission Database(GFED). The CO is primarily lofted to and spreads downwind at 800mb or 700mb with three exceptions: The Maritime Continent and South America where there is significant spread at 300mb consistent with known deep- and pyro-convection; and Southern Africa where there is significant spread at 600mb. The total mass of CO lofted into the free troposphere ranges from 46% over Central Africa to 92% over Australia.