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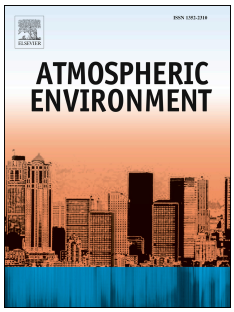


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# AMMONIA EMISSIONS IN TROPICAL BIOMASS BURNING REGIONS: COMPARISON BETWEEN SATELLITE-DERIVED EMISSIONS AND BOTTOM-UP FIRE INVENTORIES

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**Abstract.** Vegetation fires emit large amounts of nitrogen compounds in the atmosphere, including ammonia ($NH_3$). These emissions are still subject to large uncertainties. In this study, we analyze time series of monthly $NH_3$ total columns (molec $cm^{-2}$) from the IASI sounder on board MetOp-A satellite and their relation with MODIS fire radiative power (MW) measurements. We derive monthly $NH_3$ emissions estimates for four regions accounting for a major part of the total area affected by fires (two in Africa, one in central South America and one in Southeast Asia), using a simplified box model, and we compare them to the emissions from both the GFEDv3.1 and GFASv1.0 biomass burning emission inventories. In order to strengthen the analysis, we perform a similar comparison for carbon monoxide (CO), also measured by IASI and for which the emission factors used in the inventories to convert biomass burned to trace gas emissions are thought to be more reliable. In general, a good correspondence between $NH_3$ and CO columns and the FRP is found, especially for regions in central South America with correlation coefficients of 0.82 and 0.66, respectively. The comparison with the two biomass burning emission inventories GFASv1.0 and GFEDv3.1 shows good agreements, particularly in the time of the maximum of emissions for the central South America region and in the magnitude for the region of Africa south of the equator. We find evidence of significant non-pyrogenic emissions for the regions of Africa north of the equator (for