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Co-located ground-based remote sensing and in situ measurements at the tropical atmospheric observatory in Suriname

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The first ground-based remote sensing measurements of the column averaged volume mixing ratio of CO2 (XCO2) for the inner tropics have been obtained at Paramaribo, Suriname (5.8°N, 55.2°W). Due to the migration of the ITCZ over the measurement location the probed air masses belong to the northern or southern hemisphere depending on the time of the year. The XCO2 shows an average annual increase in the Southern Hemisphere of 2.2 ppm for the time period 2004 to 2007, which agrees within the error with model simulations. Co-located in-situ measurements are strongly influenced by a local source. From the isotopic composition of the air samples the local source component is suggested to be the terrestrial biosphere. Using d13C from the NOAA/ESRL stations Ascension Is. (ASC) and Ragged Point (RPB) the data has been corrected for the local source component. The corrected mixing ratios for the surface as well as the XCO2 qualitatively agree with model simulations.