



Ground-level nitrogen dioxide concentrations over Colombia, South America, inferred from the satellite-borne Ozone Monitoring Instrument

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We infer ground-level nitrogen dioxide (NO₂) concentrations over Colombia by using the approach by Lamsal et al., 2008, which consists on applying local scaling factors from the GEOS-Chem model to tropospheric NO₂ columns retrieved from the Ozone Monitoring Instrument (OMI) onboard the Aura satellite. Monthly mean OMI surface NO₂ derived from the standard tropospheric NO₂ data product varies by more than one order of magnitude (<0.1– 6 ppbv) over Colombia. Measurements from a commercial chemiluminescent NO₂ analyzer equipped with a molybdenum converter are used as ground-based data set to validate the surface NO₂ estimate and indirectly validate the OMI tropospheric NO₂ retrieval.

An interference correction algorithm for the commercial analyzer is applied using modeled concentrations of the interfering species. The correlation between the OMI-derived surface NO₂ and the ground-based measurements is significant (correlation coefficient up to 0.71) . The satellite-derived data base of ground level NO₂ concentrations could be valuable for assessing exposures of humans and vegetation to NO₂ and for evaluating effectiveness of air quality control strategies.