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OMI measurements of volcanic and anthropogenic SO_2

N. Krotkov (1,3), S. Carn (2), A. Krueger (2), P. Bhartia (3) and K. Yang (4,3)

(1) Goddard Earth Sciences and Technology Center, University of Maryland Baltimore County (UMBC), USA, (2) Joint Center for Earth Systems Technology, UMBC, USA, (3) Laboratory for Atmospheres, NASA Goddard Space Flight Center, USA, (4) Science Systems and Applications, Inc. USA (krotkov@chescat.gsfc.nasa.gov / Fax: 301-6145903 / Phone: 301-614-5553)

The Ozone Monitoring Instrument (OMI) on NASA EOS Aura offers unprecedented spatial and spectral resolution, coupled with global coverage, for space-based UV measurements of sulfur dioxide (SO_2). An operational retrieval algorithm (the Band Residual Difference [BRD] algorithm) produces SO_2 column amounts using calibrated residuals at SO2 absorption band centers produced by the NASA operational ozone algorithm (OMTO3). The BRD algorithm has been providing unique observations of SO_2 in volcanic and polluted regions. Using the BRD technique we are measuring passive degassing from several volcanoes on a daily basis. By using optimum wavelengths for retrieval of SO_2, the retrieval sensitivity is improved over NASA predecessor Total Ozone Mapping Spectrometer (TOMS) by factors of 10 to 20, depending on location. The ground footprint of OMI is 8 times smaller than TOMS. These factors produce two orders of magnitude improvement in the minimum detectable mass of SO_2. Thus, the diffuse boundaries of volcanic clouds can be imaged better and the clouds can be tracked longer. Anthropogenic SO_2 has been detected over eastern China, South America and Europe.