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Satellite observations of tropospheric BrO

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We present an algorithm to retrieve tropospheric BrO columns from satellite nadir UV/visible observations based on an innovative stratospheric BrO correction that makes use of a recently developed dynamical climatology of stratospheric BrO (Theys et al., Atmos. Chem. Phys., 2009). This climatology has been generated using output from the BASCOE three-dimensional chemical transport model, which includes a contribution to the stratospheric inorganic bromine budget from very short-lived brominated sources gases. Model simulations have been extensively validated through comparison with several independent correlative data sets of stratospheric BrO observations, including ground-based, balloon-borne and space-limb techniques.
We describe results from global tropospheric BrO column retrievals obtained from the METOP GOME-2 instrument. Our new approach to correct for the stratospheric BrO absorption allows separating the large-scale stratospheric BrO structures from those of tropospheric origin in the total BrO column field measured from space. This results in a refined and more quantitative interpretation of the nadir BrO observations and allows e.g. to study with reduced ambiguity the transport of BrO plumes emitted in the polar boundary layer.