

## A Reevaluation of the Contribution of Very Short Lived Gases to Stratospheric Bromine: Implications for the Bromine Explosion

Ross J. Salawitch (1), Pamela Wales (1), Sungyeon Choi (2), Joanna Joiner (2), George Mount (3), Elena Spinei (2), Kelly Chance (4), Raid Suleiman (4), Nicolas Theys (5), Francois Hendrick (5), and Michel Van Roozendael (5)

(1) University of Maryland, College Park, USA, (2) NASA Goddard Space Flight, Greenbelt, Maryland, USA, (3) Washington State University, Pullman Washington, USA, (4) Harvard-Smithsonian Center for Astrophysics, Cambridge, Massachusetts, USA, (5) Belgian Institute for Space Aeronomy, Brussels, Belgium

The Aura Ozone Monitoring Instrument (OMI) has provided global measurements of total column BrO over the past decade. Interpreting the distribution of total column BrO between the stratosphere and troposphere depends strongly on the contribution of very short lived (VSL) bromocarbons to stratospheric inorganic bromine (Bry). Salawitch et al. (2010) suggested 7 to 12 ppt of Bry must be supplied to the lower stratosphere from the decomposition of VSL bromocarbons to accurately represent the variation of total column OMI BrO with total column O<sub>3</sub>. However, stratospheric BrO and organic bromine measurements collected during the CONTRAST and ATTREX aircraft campaigns in the tropical Western Pacific in the winter of 2014 indicated a lower VSL estimate (3 to 7 ppt) than proposed in Salawitch et al. (2010). Here we will assess the discrepancy between the tropical Western Pacific and satellite-based VSL estimates in light of ground-based total column BrO measurements obtained over Fairbanks, Alaska using a multifunction differential optical absorption spectroscopy (MFDOAS) instrument during the spring of 2011. Additionally, we will assess how modifications to kinetics regulating the partitioning between BrO and BrONO<sub>2</sub> proposed by Kreycy et al. (2013) affect the VSL Bry estimate as well as the modeled diurnal variation of BrO. Finally, we will show the implications of this work for an estimate of residual tropospheric BrO, from which properties of the Arctic bromine explosion will be shown.

Kreycy, S. et al. *Atmos. Chem. Phys.* 2013, 13, 6263-6274, doi:10.5194/acp-13-6263-2013.  
Salawitch, R.J. et al. *Geophys. Res. Lett.* 2010, 37, L21805, doi:10.1029/2010GL043798.