

## **Measurements of bromine monoxide and iodine monoxide in the lower stratosphere: constraints on total inorganic bromine and iodine**

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Halogens have important direct and indirect effects on atmospheric chemistry e.g. ozone destruction, oxidative balance, mercury processing, particle seeding and growth. The monoxides of bromine and iodine (BrO and IO) are important constituents of inorganic halogens that were measured by the Airborne Multi AXis Differential Optical Absorption Spectroscopy (AMAX-DOAS) instrument during the The CONvective TRansport of Active Species in the Tropics (CONTRAST) campaign. Here we examine two case studies – CONTRAST RF06 and RF15 – which sampled the tropical UTLS during a horizontal transect jet-crossing into the mid-latitude lower stratosphere. We have accomplished a first detection of IO in the lower stratosphere. We compare our observations with the global chemistry climate model CAM-Chem, and the global chemistry transport model GEOS-Chem. We further use a chemical box-model, constrained by measurements of BrO and IO as well as by AWAS, TOGA, and other measurements on the aircraft, to determine the total budgets of inorganic bromine and iodine, and investigate correlations of total Br<sub>y</sub> and I<sub>y</sub> with air mass indicators such as CFC-11.