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MAX-DOAS IO and BrO measurements in the western pacific boundary layer

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In October 2009 ship-borne MAX-DOAS measurements of IO and BrO have been performed during the TRANSBROM campaign from Japan to Australia on board the research vessel "Sonne" in the western pacific region.

The TRANSBROM campaign was carried out by the IFM-Geomar, Kiel, and focused on short living bromine compounds in the ocean and their transport into the stratosphere, where they could play a role in ozone depletion. Various measurement techniques such as radio-, ozone sondes, air and water samples as well as the ground based remote sensing technique MAX-DOAS were used.

Differential Optical Absorption Spectroscopy (DOAS) is a spectroscopy method using the absorption signature of different trace gases to detect them in scattered sunlight spectra. Thus, DOAS is capable to measure various trace gases such as Ozone, Nitrogen dioxide, Formaldehyde and reactive halogens IO and BrO. The geometry of ground-based Multi Axis Differential Optical Absorption Spectroscopy (MAX-DOAS) provides high sensitivity for trace gases in the lower troposphere. Radiative transfer models (RTM) are used to calculate atmospheric vertical trace gas columns and profiles.

The performed MAX-DOAS measurements during the TRANSBROM campaign show the presence of Iodine oxide (IO) in the marine boundary layer throughout the whole cruise. In addition, also BrO was measured in parts of the Coral sea. Retrieved trace gas profiles are interpreted by means of complementary data (i.e. chlorophyll, weather data).