



## Observation of polar tropospheric BrO plumes from TROPOMI data

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During polar spring, large areas of enhanced bromine monoxide (BrO) concentrations occur in the Arctic and Antarctic tropospheric boundary layer. These rapidly evolving accumulations of bromine play an important role in the chemistry of the troposphere as they effectively catalyse destruction of tropospheric ozone. Although details are still not fully understood, autocatalytic release of bromine oxides - referred to as bromine explosion - from the condensed phase appears to be the dominating source mechanism. Enhanced BrO concentrations have been observed by ground-based measurements as well as from satellite, where the large spatial coverage allows to study the spatial extent of the phenomenon and its correlation with meteorological data.

The high spatial resolution of S-5P/TROPOMI (3,5 km x 7 km) allows to better localize these events and to resolve finer structures compared to previous satellite measurements. Together with the better than daily coverage over the polar regions, this allows deeper investigations of the spatio-temporal variability of enhanced BrO concentrations and their relation to different possible bromine sources and release mechanisms.

In this study, we present tropospheric BrO column densities retrieved from TROPOMI data using Differential Optical Absorption Spectroscopy (DOAS). The algorithm separating the tropospheric partial column from the total column builds on statistical methods applied on measured satellite data (BrO, O<sub>3</sub>, and NO<sub>2</sub>) and does not require any model data. Furthermore, correlations of selected bromine explosion events will be discussed with regard to meteorological phenomena.