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Transport of tropospheric BrO by high latitude cyclones

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GOME-2 onboard the MetOp-A satellite regularly observes intense, spiral shaped plumes of tropospheric bromine monoxide (BrO) at the poles over sea ice during polar spring. These are often associated with ozone and gaseous elemental mercury depletion caused by an autocatalytic chemical cycle, the so called "bromine explosion". However, not much is known on the role that weather systems play for the formation, duration and transport of BrO plumes.

Here, we show that high latitude cyclones are linked to spiral shaped BrO plumes observed by GOME-2 and can play an important role for their formation. A new method for detecting BrO Cyclonic Transport Events based on satellite observations and meteorological simulations is presented and characteristics of these events such as their frequency, spatial distribution and intensity are discussed.