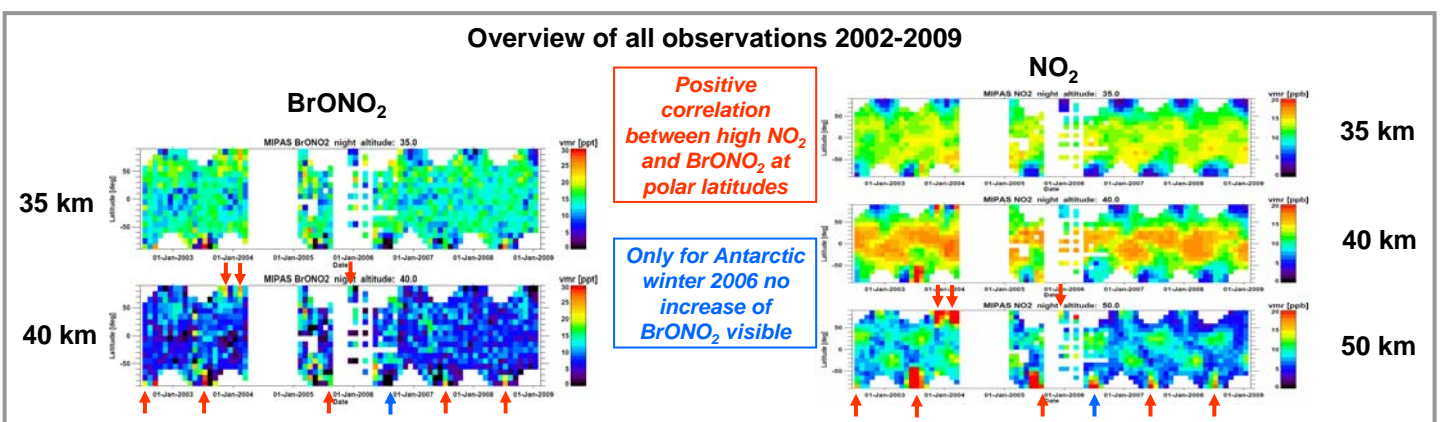
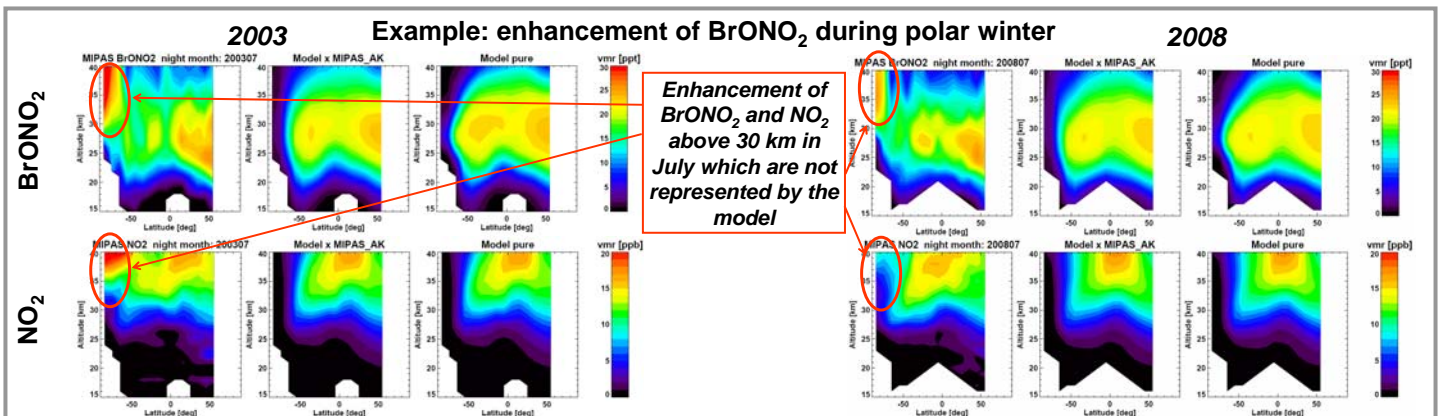
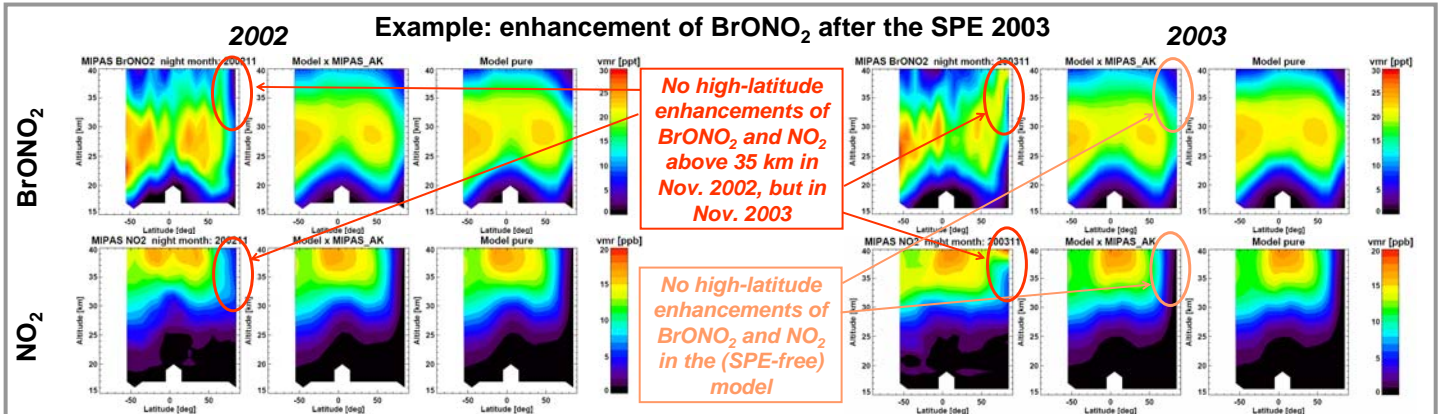


- Bromine nitrate (BrONO₂) in the stratosphere has been observed for the first time through high-resolution limb IR-emission spectra measured by the Michelson Interferometer for Passive Atmospheric Sounding (MIPAS) aboard the European Envisat satellite [1]. This allows to test our current understanding of stratospheric bromine chemistry.
- Monthly zonal mean altitude profiles of BrONO₂ volume mixing ratios have been determined globally with a latitude resolution of 10° during sunlit and dark conditions from July 2002 until January 2009.
- In the following, MIPAS nighttime observations of BrONO₂ in combination with NO₂ (which has been determined from the same spectral region) are shown together with model results of EMAC (ECHAM/MESSy Atmospheric Chemistry [2,3]) standard version which does not include SPE or other effects leading to an increase of polar NO_x (EMAC BrONO₂-results have been multiplied by a factor of 1.25 for better comparability. A possible high bias of the MIPAS observations is under discussion but does not affect the conclusions drawn here.)



Summary:

- First observations of BrONO₂ by MIPAS show large enhancements at high polar latitudes correlated with the increase of NO₂ caused by in-situ production (SPE) or downward transport in the polar vortex.
- These enhancements are not reflected in standard EMAC-model calculations.
- The observed increase of BrONO₂ in November 2003 after the SPE is in-line with WACCM3 model results after SPEs by Jackman et al. [4] (reaction: Br + NO₂ + M → BrONO₂ + M).
- The increase of BrONO₂ is present during all MIPAS observations between 2002-2009 but not in 2006. The reason for this is still not understood.

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