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A global stratospheric bromine monoxide climatology based on the BASCOE chemical transport model

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Abstract. A new climatology of stratospheric BrO profiles based on a parameterization using dynamical and chemical indicators has been developed, with the aim to apply it to the retrieval of tropospheric BrO columns from space nadir measurements. The adopted parameterization is based on three years of output data from the 3-D chemistry transport model BASCOE. The impact of the atmospheric dynamics on the stratospheric BrO distribution is treated by means of Br_y/ozone correlations built from 3-D-CTM model results, while photochemical effects are taken into account using stratospheric NO₂ columns as an indicator of the BrO/Br_y ratio. The model simulations have been optimized for bromine chemistry and budget, and validated through comparisons using an extensive data set of ground-based, balloon-borne and satellite limb (SCIAMACHY) stratospheric BrO observations.

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