Modeling oceanic emissions of brominated VSLS under a changing climate

Stratospheric bromine budget and the impact on ozone

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Very short-lived substances (VSLS) of mainly natural, oceanic origin, contribute significantly to the tropospheric and stratospheric bromine loading. About 25% of the bromine loading in the stratosphere is due to oceanic emissions of VSLS for present day conditions. In recent years, there had been much progress in understanding emission and transmission processes of VSLS supplying bromine to the stratosphere. Integration of these in chemistry climate models (CCM) results in a good agreement with available observation.

Transport and Dynamics

VSLS flux from ocean is held constant.
- Change in anthropogenic bromine emissions dominates
- Stratospheric values not directly comparable due to rising tropopause (about 0.81 hPa/decade [7,8])
- Strato. increase of Br$_{tr}$ from VSLS driven by Brewer-Dobson circulation
- Tropo. decrease of Br$_{tr}$ from VSLS due to [OH] and temperature
- No increase of Br$_{tr}$ at same ΔP from tropopause

References


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