



## **Convective transport of short-lived source gases into the tropical tropopause region and the stratospheric bromine budget**

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In recent years it has been realized that in addition to long-lived ozone depleting substances such as the CFCs or halons also short-lived halogen compounds can contribute significantly to the stratospheric halogen loading. We estimate the contribution of short-lived bromine source gases (most importantly bromoform) to the stratospheric bromine loading by using convective mass fluxes from the one dimensional model of Folkins and Martin (2005), which is constrained by observed tropical mean profiles of temperature and humidity. A critical factor in these calculations is then the removal of degradation products of the source gases from the tropical tropopause layer (TTL), which is believed to be due to scavenging by falling ice. This relates the transport of short-lived bromine species into the stratosphere to processes of dehydration in the TTL.

The calculated fluxes of short-lived bromine species into the stratosphere are then compared with bromine monoxide observations in the tropical lower stratosphere from SCIAMACHY/ENVISAT in order to derive a budget of the stratospheric bromine loading.