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Quantifying the input of halogen species into the stratosphere

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Halogen atoms which can cause a depletion of stratospheric ozone are transported into the stratosphere mainly in the form of long lived source gases. For the stratospheric overworld the predominant input is via the tropical tropopause. We will present observations of a wide range of source gases for stratospheric bromine and chlorine from the tropical tropopause layer up to the middle stratosphere. The data are derived from gas chromatography/mass spectrometry measurements of whole air samples collected above Teresina/Brazil (5°S) during balloon flights carried out in 2005 and 2008. Total organic bromine and chlorine is derived from these observations. While the chlorine budget seems to be well understood, the sum of bromine derived from organic source gases is lower than estimates of total bromine based on measurements of inorganic bromine species. We further discuss the expected long term evolution of chlorine and bromine in the stratosphere, based on past observations, measured distributions of mean age and emission scenarios.