QOS2016-226, 2016
Quadrennial Ozone Symposium of the International Ozone Commission

Linking the uncertainty in modelling of tropical stratospheric water vapour to simulated arctic ozone losses

L. Thölix (1), A. Karpechko (2), L. Backman (1), and R. Kivi (3)

(1) Finnish Meteorological Institute, Climate Research, Helsinki, Finland (laura.tholix@fmi.fi), (2) Finnish Meteorological Institute, Arctic Research, Helsinki, Finland, (3) Finnish Meteorological Institute, Arctic Research, Sodankylä, Finland

Stratospheric water vapor plays a key role in atmospheric chemistry. It e.g influences the chemical ozone loss via controlling the PSC formation in the polar stratosphere. The amount of water entering the stratosphere through the tropical tropopause differs substantially between CCMs because the present-day models have difficulties in capturing the whole complexity of processes that control the water transport across the tropopause. As a result there are large differences in the stratospheric water vapour between the models. In this study we investigate the sensitivity of simulated Arctic ozone loss to the amount of water which enters the stratosphere through the tropical tropopause. We use stratospheric chemistry-transport model FinROSE driven by ECMWF meteorological fields and prescribed tropospheric abundances of the chemicals. Several simulations of the Arctic winters between 2010 and 2015 are performed with differed water vapour concentrations at the tropical tropopause. Simulations show differences in PSC areas and chlorine activation. Results indicate a sensitivity of the Arctic ozone loss to the tropical water vapour.