Geophysical Research Abstracts
Vol. 20, EGU2018-16031-3, 2018
EGU General Assembly 2018

Future trends in Arctic temperature and ozone in CCMI models

Franziska Schmidt, Ulrike Langematz, and the CCMI PIs
Free University Berlin , Institute of Meteorology, Germany

Changing concentrations of greenhouse gases (GHG) and ozone-depleting substances (ODS) are known to have future impacts on the stratospheric ozone layer. A radiatively induced cooling of the stratosphere favours the conditions for polar stratospheric cloud (PSC) formation and the depletion of ozone in spring. In contrast, the impact of the cooling on chemical reaction rates and a strengthening of the residual circulation will lead to a *super recovery* of ozone at the end of the 21th century.

Previous studies with two different chemistry-climate models (CCM) have reported a significant cooling of the stratosphere in early winter between 1960 and 2100. They also revealed the possibility of exceptional cold Arctic winters with ozone destruction even in the second half of the century. In order to confirm and further investigate the process, an analysis of the CCM of the IGAC/SPARC Chemistry-Climate Model Initiative (CCMI) was carried out. Trends in temperature together with the evolution of total column ozone and the potential volume of PSC (V_{PSC}) have been examined.

A cooling of the Arctic stratosphere in early winter could be found in almost all CCMI models while a consistent trend for the rest of the winter is not evident. The results for V_{PSC} and total ozone suggest a wide spread between the models.