Geophysical Research Abstracts
Vol. 15, EGU2013-13468, 2013
EGU General Assembly 2013

Polar stratospheric ozone: interactions with climate change, results from the EU project RECONCILE, and the 2010/11 Arctic ozone hole

Marc von Hobe and the RECONCILE Science Team
Forschungszentrum Jülich, IEK-7, Jülich, Germany (m.von.hobe@fz-juelich.de, +49-2461-615346)

One of the most profound and well known examples of human impacts on atmospheric chemistry is the so called ozone hole. During the second half of the 20th century, anthropogenic emissions of chlorofluorocarbons (CFCs) led to a significant increase in stratospheric chlorine levels and hence the rate of ozone removal by catalytic cycles involving chlorine. While CFCs were essentially banned by the 1987 Montreal Protocol and its subsequent amendments, and stratospheric chlorine levels have recently started to decline again, another anthropogenic influence may at least delay the recovery of the stratospheric ozone layer: climate change, with little doubt a result of human emissions of carbon dioxide and other greenhouse gases, has led to changes in stratospheric temperature and circulation. The large ozone losses that typically occur in polar regions in spring are particularly affected by these changes.

Here, we give an overview of the ozone-climate interactions affecting polar stratospheric ozone loss, and present latest results from the international research project RECONCILE funded by the European Commission. Remaining open questions will be discussed including the possible impacts of recently suggested geoengineering concepts to artificially enhance the stratospheric aerosol loading. A special focus will also be put on the 2010/11 Arctic winter that saw the first Arctic Ozone hole, including an impact study on surface UV radiation in the densely populated northern mid-latitudes.