SPARC Workshop SHARP2016

Observed and modelled long-term changes of the ozone layer

Dr. Wolfgang Steinbrecht

Deutscher Wetterdienst

Wolfgang.Steinbrecht@dwd.de

Anthropogenic ozone depleting substances and greenhouse gases have had, and will have, significant effects on the ozone layer. The international Montreal Protocol and its amendments have very successfully ended the emission of ozone depleting substances. This has stopped stratospheric ozone decline by the late 1990s. Since 2000, ozone levels have remained more or less constant in the stratosphere, with some indications for beginning recovery, most notably in the upper stratosphere, around 40 km. Up there, the recent decline of ozone depleting substances and ongoing stratospheric cooling due to increasing CO2 have contributed roughly one half each to recent ozone increases. Over the next 50 to 100 years, the ozone layer will be influenced more and more by increasing greenhouse gases and climate change, and less and less by declining ozone depleting substances. By 2100, the most important changes are expected from radiative cooling due to increased CO2 (and other greenhouse gases), and from radiative and chemical effects of increased N2O and CH4.