

## **Modelling the 11-year solar signal in a changing climate**

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The 11-year solar cycle influence on stratospheric ozone and temperature as well as its appearance in the troposphere is investigated in a chemistry climate model (CCM) simulation covering the period 1960 to 2100. An important prerequisite for a successful simulation of the solar signal with a CCM is a realistic background climatology. The impact of a changing background climatology due to anthropogenic climate change is assessed by comparing composite differences and multiple linear regression results representative for the 20th century and the second half of the 21st century, respectively. The focus of the analyses is on temperature, zonal wind and geopotential height.

The EMAC-FUB CCM is forced with prescribed modelled sea surface temperatures and sea ice, projected abundances of greenhouse gases according to the SRES A1B scenario and ozone depleting substances following the adjusted WMO A1 scenario. Spectral solar irradiance data from the solar cycles 20 to 23 were repeated to prescribe solar variability in the future.