



Sensitivity studies with the chemistry-climate model E39/C

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The fully coupled chemistry-climate model E39/C is employed for ensemble simulations covering the time period between 1960 and 2020. As boundary conditions observed and predicted changes with respect to sea surface temperature and ice cover, concentrations of radiative active gases (e.g. CO₂, CH₄, N₂O), emissions of nitrogen oxides and chlorine compounds, etc. are used. Additionally, the effects of large volcanic eruptions (Agung: 1963; El Chichon: 1982; Pinatubo: 1991) are considered in the chemistry module and the radiation scheme of E39/C. The solar cycle is taken into account and the quasi-biennial oscillation (QBO) is nudged according to observations of the equatorial wind field.

The model results are compared to observations, in particular to long-term measurements derived from satellite instruments and ground based stations. Moreover, sensitivity simulations with regard to the solar cycle effect and impact of climate change are performed. The analyses which will be presented will focus on the impact of these factors on ozone recovery.