

# **ODS and GHG dependences of ozone destruction in the northern mid and high latitudes in a chemistry-climate model**

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The amount of ozone in the Arctic shows a large year-to-year variation, reflecting the year-to-year variation in the Arctic atmosphere such as variations in temperature and Arctic polar vortex. These variations make it difficult to detect the dependence of ozone amount on the concentration of ozone depleting substances (ODS) and greenhouse gases (GHG). In order to clarify the dependence of the amount of Arctic ozone on ODS and GHG concentrations, we performed several 100-ensemble simulations with a fixed ODS and GHG concentration using the MIROC3.2 Chemistry-Climate Model (CCM). The results show that the increase in ODS from the year 1960 level to the year 2000 level lowered the ensemble mean value of the minimum total ozone in the region 45°N-90°N for the period March-April, and that the variance of the minimum total ozone values for the 100 ensemble was enlarged because of the appearance of ensembles with very low total ozone. The GHG increase from the year 2000 level to the year 2050 level of the IPCC-RCP6.0 scenario raised the ensemble mean value of the minimum total ozone, but a few ensembles showed very low total ozone with a long duration, which did not appear in the year 2000 level simulation.

Key words: ozone, Arctic, CCM, ODS, GHG