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A chemistry-transport model simulation of middle atmospheric ozone from 1980 to 2019 using coupled chemistry GCM winds and temperatures

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Abstract. A global 40-year simulation from 1980 to 2019 was performed with the FinROSE chemistry-transport model based on the use of coupled chemistry GCM-data. The main focus of our analysis is on climatological-scale processes in high latitudes. The resulting trend estimates for the past period (1980–1999) agree well with observation-based trend estimates. The results for the future period (2000–2019) suggest that the extent of seasonal ozone depletion over both northern and southern high-latitudes has likely reached its maximum. Furthermore, while climate change is expected to cool the stratosphere, this cooling is unlikely to accelerate significantly high latitude ozone depletion. However, the recovery of seasonal high latitude ozone losses will not take place during the next 15 years.

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