WILL CLIMATE CHANGE INCREASE OZONE DEPLETION FROM LOW-ENERGY-ELECTRON PRECIPITATION?

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We investigate the effects of a strengthened Brewer-Dobson circulation on the transport of nitric oxide (NO) produced by energetic particle precipitation. During periods of high geomagnetic activity, low energy electron precipitation is responsible for winter time ozone loss in the polar middle atmosphere between 30 and 40 km. However, as climate change is expected to increase the strength of the Brewer-Dobson circulation, NO is expected to be transported to lower altitudes, becoming even more significant in the ozone budget. We use simulations with the chemistry climate model system ECHAM5/MESSy to compare present day effects of low energy electron precipitation with expected effects in a climate change scenario.

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