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Effects of Stratospheric Ozone Change on Photochemistry and Air Quality in the Troposphere

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Stratospheric ozone has experienced significant depletion since the late 1970s, especially over the high latitude regions and is expected to recover in the coming century. The changes in stratospheric ozone column could strongly affect photochemistry in the troposphere by affecting the solar actinic flux. An increase in ozone column implies decreased ozone photolysis rate and hence increased atmospheric lifetime of ozone in the troposphere. We examined the consequences of stratospheric ozone changes for tropospheric chemistry, surface ozone air quality as well as the intercontinental transport of tropospheric ozone with a global chemical transport model. We also compare these effects with those due to other factors in the context of global change, such as changes in climate, land use/land cover and anthropogenic emissions.