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Quantifying uncertainty in the dynamical response to ozone recovery

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The Antarctic polar night jet (PNJ) has been observed to intensify during spring in recent decades and this has had substantial effects on the region's climate. This intensification has been linked to the dramatic decrease in spring stratospheric ozone concentrations that began in the mid-1970s and is projected to reverse during the twenty-first century. We present changes to the southern hemisphere circulation projected from 2000 to 2080 in a perturbed physics ensemble of a coupled atmosphere-ocean general circulation model and assess the degree to which these changes can be attributed to the projected recovery of stratospheric ozone. We find that ozone recovery will reduce the PNJ strength and cause a weakening and northward shift of the DJF tropospheric jet. Varying the physics parameterization affects the zonal wind response to ozone recovery of the SON stratosphere by $\sim$10% and that of the DJF troposphere by $\sim$25%. This response to ozone recovery alone is found to be strongly correlated with the 21st century global mean surface temperature change in response to all forcings.