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Towards understanding the atmospheric circulation response to anthropogenic forcing

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Observations and numerical experiments suggest that anthropogenic emissions have and will continue to drive a poleward contraction of the mid-latitude jets in both hemispheres. But the physical mechanisms that drive the observed and simulated trends remain unclear. In this work, we will examine the mechanisms that underlie the trends in the mid-latitude circulation using a simple atmospheric model. The results suggest that the response of the mid-latitude jets to climate change can be interpreted in the context of 1) the projection of anthropogenic forcing onto the meridional slope of the extratropical isentropic surfaces; and 2) a diffusive model of the eddy fluxes.