Stratosphere-troposphere coupling: Comparison of climate simulations with high top and low top versions of CESM/WACCM

<u>Anne Smith</u>[†]; Daniel Marsh; Michael Mills; Douglas Kinnison; Natalia Calvo [†]NCAR, USA Leading author: <u>aksmith@ucar.edu</u>

WACCM (Whole Atmosphere Community Climate Model) is one of the atmospheric components of the NCAR CESM (Community Earth System Model) that has a much higher upper boundary position (at 5.9x10-6 hPa in the thermosphere) and includes interactive chemistry throughout the domain. To investigate the impact of the boundary position and chemistry on the simulated climate, we compare WACCM climate to that from low top CESM (highest level at 3.5 hPa) modified to have identical resolution, physics, and suite of parameters. Both model versions include a fully coupled ocean. We compare parallel simulations of the second half of the 20th century performed under the CMIP5 framework. Both the interactive chemistry (present only in WACCM) and the vertical domain affect the model troposphere. The analysis for this presentation will focus on the impact of a deep and well-resolved middle atmosphere on the simulated climate.