

# WACCMX Simulations of the 2002 and 2019 Southern Hemisphere Sudden Stratospheric Warmings

\*Nicholas M Pedatella<sup>1</sup>

1. National Center for Atmospheric Research

Sudden stratospheric warmings (SSWs) are characterized by large-scale, rapid, changes in the polar winter middle atmosphere, and also lead to large variability throughout the whole atmosphere, including changes in the mesosphere, thermosphere, and ionosphere. SSWs occur in roughly six out of ten Northern Hemisphere winters, and, due to hemispheric differences in planetary wave activity, are significantly less frequent in the Southern Hemisphere. Though rare, Southern Hemisphere SSWs have occurred recently in 2002 as well as 2019. With these two events, it is possible to investigate similarities and differences between SSW events in the Northern and Southern Hemispheres. Simulations of the 2002 and 2019 Southern Hemisphere SSWs are performed using in the Specified Dynamics version of the Whole Atmosphere Community Climate Model with thermosphere-ionosphere eXtension (SD-WACCMX). The simulations are used to compare and contrast variability in mesospheric tides and the equatorial ionosphere during Southern and Northern Hemisphere SSW events.