Assessment of Atmospheric Simulations

Over the Antarctica with E3SM Regional Refinement Model

Shixuan Zhang1, Wuyin Lin2, Qi Tang3, Erika Roesler4, Andrew Bradley4

1Pacific Northwest National Laboratory 2Brookhaven National Laboratory

3Lawrence Livermore National Laboratory 4Sandia National Laboratories

E3SM’s regional refinement modeling capability is used to exploit the benefit of high-resolution in simulating the climate around the Antarctica at more affordable computational cost. In this study, we will report the status of the Antarctica regional refinement mesh (RRM) for the E3SM atmosphere model, and provide an assessment of its skill in simulating the climate in the southern polar region. The assessment will focus on the relative performance of RRM simulations as well as globally uniform low- and high-resolution simulations, in comparison to observational and reanalysis data products. The outcome also serves as a guidance for E3SM Phase 2 cryosphere simulation campaign with regional refinement model configurations.