



Impact of stratospheric El Niño Modoki signal on tropospheric climate

I. Zubiaurre (1), N. Calvo (1), and C. Cagnazzo (2)

(1) Universidad Complutense de Madrid (UCM), Madrid (Spain) , (2) Institute of Atmospheric Sciences and Climate (ISAC) of the Italian National Research Council (CNR), Rome (Italy)

Recent studies have shown a significant warming in the Southern Hemisphere polar stratosphere in both reanalysis data and chemistry climate models when the sea surface temperature anomalies typical of ENSO events maximize in the Central Pacific Ocean (El Niño Modoki) instead of the Eastern part (Canonical El Niño). This signal is related to anomalous wave mean flow interaction in the Southern Hemisphere associated with anomalous convection. In our study, we investigate the downward propagation of El Niño Modoki signal from the stratosphere into the troposphere and its impact on the surface, to find whether or not a similar effect to that generated by warm canonical ENSO events on the Northern Hemisphere exists over Antarctica. To do so, two high-top models with a well resolved stratosphere [the Whole Atmosphere Community Climate Model 3.5 (WACCM3.5) and the Middle Atmosphere European Centre/Hamburg Model (MAECHAM5)] and their low top versions with their tops in the middle stratosphere [the Community Atmosphere Model 3.5 (CAM3.5) and the European Centre/Hamburg Model (ECHAM5)] are analyzed here. Both high top models exhibit significant anomalies in zonal mean zonal wind over the polar cap that reach the surface and consequently, a negative pattern of the Antarctic Oscillation (AAO) during April-July months. However, the signal in sea level pressure is much weaker in the low top models, which suggests the stratospheric influence on the Modoki signal over Antarctica.