



Antarctic Oscillation at the Last Glacial Maximum

S.-J. Kim (1), J.-M. Lu (2), B.-M. Kim (1), and B.-Y. Lee (1)

(1) Korea Polar Research Institute, KORDI, Incheon, Korea (seongkim@kopri.re.kr), (2) Chinese Academy of Meteorological Sciences, Beijing 100081, China

In the Antarctic, the main climate driver is the Antarctic Oscillation (AAO). When the AAO is in positive phase, the southern hemisphere (SH) polar vortex and circumpolar westerly tend to be stronger, sea ice production increases, and Antarctica becomes colder but the Antarctic Peninsula warmer. In recent decades, the AAO has been in an increasing trend primarily due to the seasonal stratospheric ozone depletion and secondarily due to the increase in greenhouse gases. In order to examine the change in the AAO under the cold climate background, we analyzed the change in the Antarctic Oscillation (AAO) for the Last Glacial Maximum (LGM) compared to the pre-industrial (PI) simulation using 5 coupled ocean-atmosphere models (i.e. CCSM, FGOALS, IPSL, MIROC3.2, and UBRIS-HadCM3M2) from the second phase of Paleoclimate Modeling Intercomparison Project (PMIP 2). In the LGM, the amplitude of the simulated AAO appears to be smaller than the PI with a small decrease in the standard deviation of the AAO in HadCM3M2, IPSL, FGOALS, but in CCSM and MIROC the AAO amplitude appears to be slightly larger in the LGM. The overall weaker AAO in the LGM is consistent with the weaker SH polar vortex and westerly winds found in some proxy records. This result implies that under global warming the SH polar vortex and westerly winds will be stronger.