Geophysical Research Abstracts
Vol. 17, EGU2015-2749, 2015
EGU General Assembly 2015


# Asymmetric changes in bi-hemispheric circumpolar vortex in the warmer climate

Gwangyong Choi (1), David A. Robinson (2), and Junsu Kim (3)

(1) Jeju National University, Jeju, Republic of Korea (tribute@hanmail.net), (2) Rutgers, The State University of New Jersey, Piscataway, NJ, United States (drobins@rci.rutgers.edu), (3) Seoul National University, Seoul, Republic of Korea (junsu.kim@snu.ac.kr)

In this study, the observed changes and future projections of polar atmospheric circulation and potential linkages with the changing cryosphere are examined. Long-term snow and ice extent data records derived from satellite imagery (NOAA AVHRR/Microwave) and circumpolar vortex (CV) variables extracted from reanalysis and modeled geopotential height data sets are utilized in the investigation. Time series analysis of observed data sets demonstrates that the Northern Hemisphere CV in warm seasons has regressed poleward with variability of meridional meandering at regional scales, while the year-round Southern Hemisphere CV with a rather consistent shape is trendless. These asymmetric changes in bi-polar CV pathways may be associated with asynchronous disappearing cryospheric extents between the two hemispheric during warm seasons. CMIP5 modeled data sets confirm that these discrepancies in polar circulations between the two hemispheres will increase in a warmer 21st century due to intensification of the imbalance in ice mass and seasonal snow extent between the hemispheres.