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RECENT RAPID ARCTIC CHANGE AND ITS INFLUENCE ON EAST ASIA WEATHER

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Arctic is warming rapidly in recent decades and its associated sea ice reduction is remarkable. The change in the Arctic sea ice appears to modulate the atmospheric circulation pattern. In particular, the reduction of the Arctic sea ice releases heat to the atmosphere from the ocean, especially in early winter, and activates planetary wave propagation into stratosphere that leads to the weakening of the northern hemisphere polar vortex, pushing the phase of the Arctic Oscillation (AO) into more negative state at the surface[1]. Under the negative phase of the AO, cold surges over northeast Asia tend to occur more frequently and last longer by the development of stronger northerly winds over Siberia[2]. The change in the spring AO also influences the summer East Asian monsoon rainfall by a teleconnection through the North Pacific. These results suggest that even though the mid-latitude weather is largely governed by local synoptic weather pattern, the recent Arctic change seems to substantially modulate East Asian weather and the linkage seems to be getting stronger with time.

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[2] Woo, S.-H., B.-M. Kim, J.-H. Jeong, S.-J. Kim, G.-H. Lim, Decadal changes of surface air temperature variabilities and cold surge characteristics over the Korean peninsula and their relation for the AO for the past three decades, *Journal of Geophysical Research*, 117, D18117, doi:10.1029/2011JD016929, 2012.