



Process understanding of a linkage between East-Asian cold-surge with the unprecedented Arctic warming event in early 2016

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At the end of December 2015, Storm Frank, a major Atlantic windstorm, intruded into the Arctic-circle along with warm air and a large amount of moisture, resulting in an unprecedented Arctic high-temperature phenomenon. In late January 2016, the Eurasian continent suffered a series of strong cold events. This study performed a synoptic analysis of a daily Northern Hemisphere SLP and 500hPa, 300hPa height anomaly using JRA-reanalysis data focusing on the process understanding of the sequential development and strengthening of Siberian high in association with the generation of the Ural blocking after the Arctic warming event. From synoptic analysis, we found that, within one month period, there exist several spells of Ural blocking occurrence instead of steady occupation of persistent high pressure over Ural Mountain region. The heat intrusion from midlatitude in association with Storm Frank caused a large wave breaking event over Atlantic sector of Arctic and initiated Ural blocking. The unprecedented warm temperature in early 10 days of January 2016 caused a large sea-ice loss and further heat injection from Barents/Kara seas helping anchoring the blocking over Ural Mountain region. In January 2016, several cold events over Eurasian continent well matched with the several spell of Ural blocking events. We suggest that daily scale interactions among warm advection, downward longwave radiation, sea-ice loss, and blocking occurrence need to be carefully considered to understand true nature of Arctic-Midlatitude linkage issue.