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Abrupt evolution of the summer Arctic Oscillation and its association with blocking and anomalous hot summer

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We used NCEP-NCAR reanalysis data to statistically analyze the relationships of the summer Arctic Oscillation (summer AO) with hemispheric scale anomalous summer weather and the occurrence of blocking highs. The anomalous positive AO pattern (low pressure anomaly in the Arctic and high pressure anomaly in midlatitudes) accounts well for the hemispheric scale weather associated with anomalous blocking between the polar and subtropical
jets, whereas blocking rarely occurs during negative AO periods. The double jet stream structure is more evident during periods of anomalous positive AO than during periods of negative AO. The surface temperatures associated with the anomalous positive AO clearly show Russia to be hot, as was the case during the anomalous summer of 2010. The occurrence of a positive summer AO is therefore consistent with the hemispheric scale anomalous summer weather associated with blocking in 2010.We investigated the abrupt evolution of atmospheric patterns and the geographic distribution of blocking highs associated with the development, maintenance, and decay
periods of an anomalous positive AO. During the development period, blocking tends to occur over Europe and the Atlantic Ocean, but no significant blocking signature is evident over eastern Eurasia. During the maintenance stage, blocking tends to occur in the Far East. During the decay stage, blocking over the Pacific region is obvious. This longitudinal migration of blocking phenomena may be used to predict the evolution through time of the NAM. This study is based on Tachibana et al., (2010) published in the Journal of Geophysical Research.