



## **Relative Role of the MJO and Stratospheric Variability in North Atlantic Climate Patterns During Boreal Winter**

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European and eastern U.S wintertime weather is strongly influenced by large-scale modes of variability in the Northern Hemisphere such as the AO and NAO. Improved predictability of these modes can help improve forecasts of extreme weather events across the midlatitude northern hemisphere.

Both the MJO phase 6 and 7 and stratospheric sudden warmings have been shown to lead to the negative phase of the AO but the relative role of each phenomena is not clear, and the two phenomena are themselves linked. In our work, we evaluate the relative roles of MJO phase 6/7 and stratospheric variability for northern hemisphere surface weather during boreal winter by using MERRA reanalysis data. We show that stratospheric variability leads to significantly different north Atlantic anomalies if it is preceded by MJO phase 6/7. Furthermore, MJO phase 6/7 leads to robust negative AO pattern only if it modulates the stratosphere first. Hence, proper attribution of their respective influence on surface weather needs to take into consideration the nonlinear linkages between these two phenomena. A similar analysis will be presented but for 5 Subseasonal-to-Seasonal (S2S) operational models.