



Polar Stratospheric Response to Intraseasonal Changes in Incoming Solar Radiation and the Madden Julian Oscillation

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This talk will focus on the potential for intraseasonal prediction of the polar vortex from intraseasonal solar variability and from the Madden-Julian Oscillation. Phase 7 of the Madden-Julian Oscillation leads to enhanced tropospheric wavenumber 1 wave driving of the vortex and subsequently to a weakened vortex in both reanalysis data and a comprehensive atmospheric general circulation model. The anomalies propagate down to the surface, such that the surface Arctic Oscillation is significantly modified 50 days after certain MJO phases.

Intraseasonal solar variability related to the 27 day solar cycle affects not only the deep tropics, but also the polar stratosphere. The effects on the 27 day timescale are consistent with the effects associated with the 11-year solar cycle. During EQBO, declining solar flux leads to a weaker vortex, while during WQBO, declining solar flux leads to a stronger vortex.