



Enhanced Predictability of SSW events for select phases of the MJO

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The effect of the Madden-Julian Oscillation (MJO) on the Northern Hemisphere wintertime stratospheric polar vortex in meteorological reanalysis dataset and in S2S (subseasonal to seasonal prediction project) data. In both data sources, the MJO influences the tropospheric North Pacific, and in particular it modulates the heat flux that is in-phase with the climatological planetary waves in both the troposphere and stratosphere. The phase of the MJO in which convection is propagating into the tropical central Pacific immediately precedes a weakened vortex, while suppressed MJO convection in this region precedes a stronger vortex. While previous work has shown that SSW events are generally not predictable beyond two weeks in advance, the MJO can be used to enhance the timescale of predictability to beyond three weeks. Namely, members of the reforecast ensemble that maintain a stronger MJO event also simulate a weaker vortex for start dates three weeks before historical SSW events.