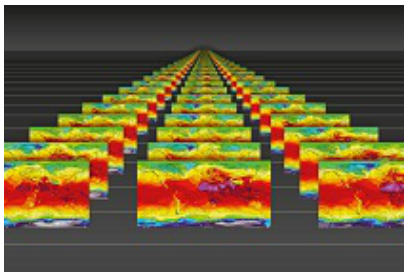

Contribution ID: **75** Type: **Oral presentation**

Extratropical predictability from the Quasi-Biennial Oscillation and the MJO in S2S models

Tuesday, 2 April 2019 16:30 (15 minutes)

The effect of the Madden-Julian Oscillation (MJO) on the Northern Hemisphere wintertime stratospheric polar vortex is evaluated in operational subseasonal forecasting models. Reforecasts which simulate stronger MJO-related convection in the Tropical West Pacific also simulate enhanced heat flux in the lowermost stratosphere and a more realistic vortex evolution. The time scale on which vortex predictability is enhanced lies between 2 and 4 weeks for nearly all cases. Those stratospheric sudden warmings that were preceded by a
strong MJO event are more predictable at ˜20 day leads than stratospheric sudden warmings not preceded by a MJO event. Hence, knowledge of the MJO can contribute to enhanced predictability, at least in a probabilistic sense, of the Northern Hemisphere polar stratosphere. One model (NCEP model) succeeds in capturing the observed relationship that the MJO->stratosphere-> Europe is more important than the direct impact of the MJO on Europe for lags longer than 3 weeks.

The effect of the Quasi Biennial Oscillation on the vortex in these same models is also evaluated. The UK Met Office model, the ECMWF model, and the NCEP model all show a Holton Tan effect that is similar though weaker to that observed. Theres is a hint of downward propagation to the surface.

Garfinkel C.I., C. Schwartz, D. I. P. Domeisen, S-W Son, A. H. Butler, I. P. White (2018), Extratropical stratospheric predictability from the Quasi-Biennial Oscillation in subseasonal forecast models , JGR, doi: 10.1029/2018JD028724.

Garfinkel, C. I., & Schwartz, C. (2017). MJO-related tropical convection anomalies lead to more accurate stratospheric vortex variability in subseasonal forecast models. Geophysical Research Letters, 44, 10,054–10,062. https://doi.org/10.1002/2017GL074470

Primary author: GARFINKEL, Chaim (Hebrew University)

Presenter: GARFINKEL, Chaim (Hebrew University)

Session Classification: Predictability and dynamics

Track Classification: Workshop on Predictability, dynamics and applications research using the TIGGE and S2S ensembles