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The Northern Annular Mode Response to Surface Forcing

This talk discusses how Arctic Oscillation/Northern Annular Mode (AO/NAM) variability is related to surface forcing from the tropics and extratropics. In observations and GCMs, a lot of wintertime tropospheric AO/NAM variability is tied to the amount of wave activity that propagates into the polar stratosphere. I will show that much of this wave activity variability is simply related to how well planetary wave anomalies align with the climatological stationary wave field --- a linear interference effect. When linear interference dominates, for a given phase and amplitude of the wave response to surface forcing, we can predict the zonal mean NAM response to surface forcing. I will show examples of how this linear interference diagnostic relates to the observed connection between boreal autumn snow cover extent over Eurasia and the wintertime NAM, and to observed and simulated connections between the NAM and tropical SST forcing. You can read about this work in papers with Chris Fletcher and Karen Smith that can be found on my website: <http://pjk.atmosp.physics.utoronto.ca>.