Examining Preferred Modes of Intraseasonal Variability of the North Pacific Jet

by

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As the primary phenomenon at the interface between synoptic-scale weather systems and the large-scale circulation, upper tropospheric jets are particularly strong governors of regional climate. Despite the substantial influence that the wintertime Pacific jet has on both sensible weather and large-scale circulation within and beyond the Pacific basin, current understanding of its intraseasonal variability is far from complete. In recent work by Jaffe et al. (2013), the use of empirical orthogonal function/principal component (EOF/PC) analysis identified the two leading modes of jet variability; an extension/retraction mode (EOF1) and a meridional shift mode (EOF2). Though prior work has described the composite structure and evolution of rapid jet retractions in the Pacific, nothing is currently known about other preferred transitions of the jet between its leading modes of variability.

In order to examine these preferred transitions, phase space diagrams characterizing the instantaneous state of the Pacific jet are constructed from the two leading principal components using the November-March 250 hPa zonal wind from 1980-2010 from the NCEP/NCAR Reanalysis. Preferred paths through the phase space can be quantitatively analyzed employing these diagrams. Based upon the results of this analysis, we will present composites of the upstream and downstream structure, evolution and sensible weather features associated with some species of preferred transitions. Additionally, implications for forecasting and predictability will be briefly discussed.