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The Effect of a Strong Zonal Jet Stream on the Temporal Evolution of Baroclinic Eddies

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The midlatitude storm tracks are one of the most prominent features of the extratropical climate. Much of our understanding of what controls the storm tracks comes from linear theory of baroclinic instability, which explains generally most of the observed response of storms to the general circulation. One example to where this approach is lacking is the Pacific midwinter minimum, a decrease in the eddy activity over the Pacific storm track during midwinter when baroclinicity is at its peak due to extremely strong zonal jets. A similar response was found recently for the Atlantic storm track**,** in correlation to periods of strong zonal jets. Following on these findings we study the effect of strong zonal jet streams on eddy activity in the midlatitudes. In order to isolate the effect of the jet strength we used several idealized GCM experiments with different jet strengths, and analyze the formed storm track from a Lagrangian perspective by using a storm tracking algorithm. In both the Eulerian analysis and analysis of the tracks a strong reduction of high level eddy activity is prominent, as well as a modest weakening of the low-level activity. The observed response is then further analyzed by studying the connection between the upper and lower wave and how it changes with jet-stream intensity.