The interannual variability of the tropical divergence tilt

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The large-scale divergence field tilts eastward with latitude moving away from its near-equatorial maximum in the summer hemisphere. This tilt, observed for all hemispheres and seasons, is also apparent in a hierarchy of models of varying complexity, including the simple Gill model. Previous theoretical work has shown that the divergence tilt determines the sign of the divergent momentum flux in the deep tropics, suggesting a possible connection to wave propagation.

In this presentation, we show that changes in the divergence tilt are one of two primary drivers of the interannual eddy momentum flux variability in the tropics. We also show that interannual changes in the divergence tilt are strongly correlated with the West Pacific Oscillation, with an associated large extratropical impact. The dynamical mechanisms behind this association are also discussed.