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Tropical eddy momentum transport

Pablo Zurita-Gotor
Facultad de Fisicas, Universidad Complutense, Madrid, Spain (pzurita@alum.mit.edu)

The upper-tropospheric momentum budget in the deep tropics reflects a balance between the easterly tendency by the Hadley cell and the westerly acceleration by the eddy momentum flux. Previous studies have shown that this momentum flux is dominated by the standing-eddy component, associated with the stationary-wave response to asymmetric tropical heating. In this presentation, we provide a simple description of tropical eddy momentum transport by relating this transport to key elements of the tropical circulation. We show that tropical eddy momentum flux arises primarily from correlations between the divergent eddy meridional velocity (zonally-asymmetric Hadley-cell component) and the rotational eddy zonal velocity (upper-troposphere Rossby gyres). We also discuss the dynamics of the coupled rotational-divergent circulation giving rise to this momentum flux and the modulation of the momentum flux by the dominant modes of tropical variability.