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Characterization of Jupiter's Deep Circulation and Static Stability through Wide Channel Numerical Simulations of the Dynamics and Interactions of Southern Midlatitudes Vortices[1] RAUL MORALES-JUBERIAS, New Mexico Tech, TIMOTHY DOWLING, University of Louisville — Previous studies have shown that the observed features and dynamics of Jovian vortices are sensitive to the underlying environmental structure of Jupiter's atmosphere, in particular to the vertical wind shear and the static stability, and that forward modeling techniques can be successfully used to eliminate a large range of possibilities in a self-consistent manner and hence constrain the atmospheric structure below the cloud regions (Youseff and Marcus 2003, Morales-Juberias et al. 2005). However, these studies have generally been done on a narrow latitude-band basis ($\approx 15^\circ$). Here we present wide channel simulations ($\approx 40^\circ$) of two major meteorological events observed in the southern atmosphere of Jupiter involving the interaction of the Great Red Spot (GRS) with other nearby vortices. By studying these two events using wide channel simulations, not unlike the strategy used in terrestrial synoptic meteorology, we show that we can gain new insights into the patterns governing Jupiter's global circulations, drawing a coherent picture of the vertical structure of the atmosphere for the whole southern mid-latitudinal regions of Jupiter over time.

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