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Title:

Longitudinal Variations in Jupiter's Winds

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Abstract:

Long-term studies of Jupiter's zonal wind field revealed temporal variations on the order of 20 to 40 m/s at many latitudes, greater than the typical data uncertainties of 1 to 10 m/s. No definitive periodicities were evident, however, though some latitudinally-confined signals did appear at periods relevant to the Quasi-Quadrennial Oscillation (Simon-Miller & Gierasch, *Icarus*, in press). As the QQQ appears, from vertical temperature profiles, to propagate downward, it is unclear why a signal is not more obvious, unless other processes dominate over possibly weaker forcing from the QQQ. An additional complication is that zonal wind profiles represent an average over some particular set of longitudes for an image pair and most data sets do not offer global wind coverage. Even avoiding known features, such as the large anticyclonic vortices especially prevalent in the south, there can be distinct variations in longitude. We present results on the full wind field from Voyager and Cassini data, showing apparent longitudinal variations of up to 60 m/s or more. These are particularly obvious near disruptions such as the South Equatorial Disturbance, even when the feature itself is not clearly visible. These two dates represent very different states of the planet for comparison: Voyagers 1 & 2 flew by Jupiter shortly after a global upheaval, while many regions were in a disturbed state, while the Cassini view is typical of a more quiescent period present during much of the 1990s and early 2000s.

Category:

07. Jovian Planets: Atmosphere

Facility Keywords: