ABSTRACT

AUTHOR: Robert A. West
California Institute of Technology
Jet Propulsion Lab

AEROSOL STRUCTURE IN JUPITER'S POLAR STRATOSPHERE

Images obtained by the Cassini Imaging Sub-System (ISS) during approach to Jupiter over a 2.5-month period beginning October 1, 2000 show the motion and evolution of stratospheric haze features and circumpolar Rossby waves. Of particular interest is a large dark oval seen only in ultraviolet wavelengths (most prominently in filter UV1, effective wavelength 263 nm). This oval is seen to form at the beginning of the period. After several weeks it appears to be about the same size and shape as Jupiter's Great Red Spot. It continues to evolve by stretching in longitude and compressing in latitude. The contrast which produces this feature is probably caused by auroral-related gas-phase chemistry or/and by very small (radius smaller than ~ 0.1 micro-meter) particles. It is not seen in near-infrared images which are sensitive to larger aerosol particles. A movie superposing the UV images and the 890-nm methane images shows that the large oval sits on the boundary of the morphologically smooth polar stratospheric haze seen in the 890-nm methane filter. These data provide interesting clues to the nature of Jupiter's polar vortex and will help to motivate a quantitative dynamical/chemical/microphysical model. This work was performed by the Jet Propulsion Laboratory, California Institute of Technology.

Remove