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Simulations of the Jovian Stratosphere with diabatic heating and mechanical forcing RICHARD COSENTINO, RAUL MORALES-JUBERIAS, New Mexico Tech — The coupling of dynamical and chemical processes in the middle atmosphere of Jupiter determines the structure of mean temperatures and mean zonal winds. The Cassini flyby of Jupiter in December 2000 provided detailed information about the mean temperatures and atmospheric abundances of methane, acetylene and ethane in the Jovian atmosphere. We incorporate a two dimensional net heating rate derived from these hydrocarbons into a general circulation model (GCM) to explore the impact on the evolution of stratospheric temperatures. This thermal forcing alone does not produce agreement between the observations and model outputs, so we also investigate mechanical forcing by waves. Atmospheric waves are known to directly impact the upper troposphere and lower stratospheres of Earth and Jupiter. Since there is not enough observational evidence to completely characterize the source spectrum in Jupiter, we implement a gravity wave drag parameterization in the GCM following Friedson (1999). This consists of a flat source spectrum of waves and dissipation mechanism like that by Lindzen and Holton (1968). We present the results obtained by using both a heating forcing derived from remote sensing observations and a mechanical forcing by waves on the Jovian stratosphere.

Richard Cosentino
New Mexico Tech

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