**Jupiter's Stratospheric Temperature Variations**

Preliminary results show Jupiter exhibits latitudinal and longitudinal temperature variations in it's stratosphere. Methane emission lines at 8.11 microns were observed on February 1-4, 2001 on the IRTF withTEXES, the Texas Echelon Cross-dispersed Echelle Spectrograph, with a resolving power of 100,000. Used in scanning mode we mapped Jupiter's northern hemisphere. The individual spectra were modeled using a radiative transfer code allowing us to retrieve stratospheric temperatures. To date, we have found a maximum thermal variation of 6 +/- 2 K between different non-auroral positions on Jupiter.

Acetylene and ethane are photochemical products of methane photolysis and are the dominant coolants in Jupiter's stratosphere (Yelle, R.V., C.A. Griffith, and L.A. Young 2001. Structure of the jovian stratosphere at the Galileo Probe entry site. Icarus 152, 331-346.). Currently, we are using the thermal profiles derived from the methane maps to model the acetylene and ethane maps taken on the same run. This allows us to test if spatial variations in acetylene and ethane line emission are due to abundance variations, to differences in temperature, or a combination of both. We will then have a map of the acetylene and ethane abundances that are not compromised by uncertainties in temperatures.

This figure shows an observed Jupiter spectrum (in green) over plotted by a best fit model used to constrain the temperature (in red). The data is representative of one spectral setting and one spatial position for the TEXES spectrometer used in scan mode covering the wavelength region of 8.10 to 8.16 microns (1225.5 to 1234.5 wavenumbers [cm-1]). This study is being carried out by Tommy Greathouse, a graduate student at the University of Texas.