An Analysis of Unidentified Spectral Features in the Two-micron Spectrum of Titan

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K band spectro-images of Titan have been obtained using the Near-Infrared Integral Field Spectrometer (NIFS) on the Gemini-North telescope with the assistance of its adaptive optics (AO) system on 7 February 2006. The extracted spectra contain numerous unidentified lines between 2.0 and 2.1 microns. The spacing of the lines, observed at resolving power of R~5,000, resemble those of typical ro-vibrational band of slightly asymmetric-top gaseous molecules. Comparisons between the observed spectra and a synthetic spectrum which includes N_2-N_2 Collision-Induced Absorption (CIA), H_2-N_2 dimer absorption, and absorption and scattering of haze particles and CH_4 will be presented. We also will discuss, in view of the presence of these unidentified features, recent claims by other authors about the spectral signatures of widespread liquid hydrocarbons based on lower resolution 2.0-2.1 micron Cassini/VIMS spectra.