Geophysical Research Abstracts
Vol. 12, EGU2010-990-2, 2010
EGU General Assembly 2010

Potentially active regions on Titan with Cassini/VIMS and Radar data: Terrestrial analogues.

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We present our study on Titan's geology in order to develop our current understanding of the satellite's active zones [1],[2]. The key aim is to study Titan's geology holistically, by means of internal activity and surface properties, in addition to terrestrial comparisons. We have applied the Principal Components Analysis (PCA) method in order to collect combined information of the seven infrared spectral windows, using the Cassini Mission Visual and Infrared Mapping Spectrometer (VIMS) data. The study areas for the moment are Tui Regio (located at 20°S, 130°W) and Hotei Regio (located at 26°S, 78°W). The main goal is to identify the composition as well as the alterations of the components that compose the possible calderas and lava flows [3], by using the principal components of the PCA method. Principal component analysis (PCA) is recommended, as our primary concern is to determine the minimum number of factors that will account for the maximum variance in the data in use in this particular multivariate analysis. Moreover, Cassini/Radar images have been processed [4] in order to study morphologically the active zones within the areas of Tui and Hotei Regio and to identify any analogues with terrestrial features. Both VIMS and Radar data [5] have provided significant information regarding the geology of the two areas, which should enable us to determine a possible internal activity as well as to identify superficial geologic structures.

References

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