

CONTROL ID: 2553711

TITLE: Constraints on the nature of various Titan Geomorphological Units with Cassini/VIMS and SAR

ABSTRACT BODY:

Abstract (2,250 Maximum Characters): We investigate the lower atmosphere of Titan from Visual and Infrared Mapping Spectrometer (VIMS) spectro-imaging data by use of a recently updated radiative transfer code in the near-IR range and RADAR/SAR data for the distinction of geomorphological units. We focus here on the geological major units identified in [1;2] and [3]: mountains, plains, labyrinths, dune fields, and possible cryovolcanic and/or evaporitic features (the latter two are albedo features, [4;5;6]). We infer surface properties (like absolute surface albedo and morphology) and atmospheric contributions, in particular the haze content. We find that the Huygens landing site and the candidate evaporitic regions pair compositionally with the variable plains, thus indicating that units of significant geomorphological differences seem to consist of very similar materials. Similarly for the labyrinth terrains and the undifferentiated plains. On the contrary, many regions from the same geomorphological unit show compositional variations depending on location (i.e. undifferentiated plains). These differences provide implications on the endogenic or exogenic origin of the various units. In previous studies we showed that the processes most likely linked to the formation of the various geomorphological units are aeolian, fluvial, sedimentary, and lacustrine, in addition to the deposition of organics through the atmosphere. Currently, we are working on deriving information on the chemical composition of the aforementioned regions from the extracted surface albedos using an extensive library of ices and tholins [e.g. 7]. This will shed light on the potential formation processes (Solomonidou et al. in prep.). Preliminary results on the chemical composition of the regions that have shown temporal changes (i.e. Tui Regio and Sotra Patera; [6]) are also presented.

References: [1] Lopes, R.M.C., et al.: *Icarus*, 205, 540-558, 2010; [2] Lopes, R.M.C., et al.: *Icarus*, 270, 162-182, 2016; [3] Malaska, M., et al.: *Icarus*, 270, 130-161, 2016; [4] Barnes, J., et al.: *Pl. Scie.*, 2:1, 2013; [5] Solomonidou, A., et al.: *JGR*, 119, 1729-1747, 2014; [6] Solomonidou, A., et al.: *Icarus*, 270, 85-99, 2016; [7] Schmitt, B., et al.: GhoSST database (ghosst.osug.fr).

CURRENT * CATEGORY: Titan: Surface

CURRENT : None

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