AGU FALL MEETING
San Francisco | 12–16 December 2016

# P33F-03: Titan's mid-latitude surface regions with Cassini VIMS and SAR

**Wednesday, 14 December 2016**
**14:10 - 14:25**
*Moscone West - 2007*

We investigate the surface of Titan by means of two Cassini instruments used in synergy. We apply a radiative transfer code to VIMS hyperspectral data to correct the strong atmospheric contribution and extract information on the surface composition [1;2;3]. We examine here the mid-latitude zones extending from 60ºN to 60ºS, which include key geological features identified in [4;5] and [6]: mountains, plains, labyrinths, dune fields, and possible cryovolcanic and/or evaporitic deposits. We find that many of the different units show compositional variations while units of significant geomorphological differences seem to consist of very similar material mixtures. The Huygens landing site and the candidate evaporitic regions are compositionally similar to the variable plains. We also find that temporal variations of surface albedo exist for two of the candidate cryovolcanic regions Tui Regio and Sotra Patera, possibly suggesting the presence of surface activity, while a number of other regions such as Hotei Regio and the undifferentiated plains remain unchanged [3]. The surface albedo variations, together with the presence of volcanic-like morphological features, suggest that the active regions are probably related to the deep interior, possibly via cryovolcanic processes (with important implications for the satellite's astrobiological potential) as also indicated by recent interior structure models of Titan and corresponding calculations of the spatial pattern of maximum tidal stresses [7]. Previous studies [3;5] showed that a variety of surface processes could be linked to the formation of the different geomorphological units (aeolian, fluvial, sedimentary, lacustrine) as well as of the deposition of atmospheric products through the process of photolysis and sedimentation of organics. The surface albedo differences and similarities among the various geomorphological terrains constrain the implications for the geological processes that govern Titan's surface and interior. [1] Hirtzig et al: Icarus 226, 470-486, 2013; [2] Solomonidou et al: JGR 119, 1729-1747, 2014; [3] Solomonidou et al: Icarus 270, 85-99, 2016; [4] Lopes et al: Icarus 205, 540-558, 2010; [5] Lopes et al: Icarus 162-182, 2016; [6] Malaska et al: Icarus 270, 130-161, 2016; [7] Sohl et al: JGR, 119, 1013-1036, 2014.

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