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The recent VIMS observations of Titan's surface and atmosphere : implications for the methane cycle

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The Visual and Infrared Mapping Spectrometer (VIMS) onboard the CASSINI spacecraft has realized its first high resolution observation of Titan's surface in October 2006 during flyby T20. We used two modes of observations : a line mode that allowed us to obtain a long NW-SE swath that cross-cuts several radar images and a classic pointing mode that provided a high resolution 64.64 image (Jaumann et al., this meeting) and a mosaic of an area located in the Southern hemisphere. We will report on interpretations of these different data sets. They include observations of cryovolcanic flows, mountain ranges, dune fields and clouds.

Flyby T22 allowed us to observe the Northern hemisphere and its polar hood. These observations confirm the global circulation model proposed by Rannou et al. (Science, 2006). The VIMS observations suggest that methane is released in Titan's atmosphere by cryovolcanism. The atmospheric circulation leads to the formation of clouds, the precipitation of hydrocarbons, the accumulation by wind of dunes made of small-size particles of hydrocarbons, the formation of lakes, etc ... In this study, we use the different geological features seen by the VIMS and Radar to constrain the sources and sinks of methane.