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Cassini Radar at Titan : Evolving Studies of an Evolving World

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The Cassini RADAR investigation continues to explore Titan : here I summarize some recent and ongoing developments. Geological interpretation of SAR imaging engages a wide community, in particular addressing Titan's dunes, lakes, seas and fluvial systems, impact craters and possible cryovolcanic features. Mapping of these features continues to suggest a dynamic world, with geologically-recent surface change due to tectonic, hydrological and aeolian processes. Mapping of fluvial channels and shoreline features suggests some tectonic controls and spatially-variable land/sea level changes. A despeckle filter applied to the images has proven popular for image interpretation, for example in resolving what may be star- and barchanoid dune morphologies which contrast with the dominant linear type. New observations in 2012 (T83, T84 and T86) place bounds on liquid accumulation in the northern polar regions - not expected to be substantial for another couple of years - and have highlighted a possibly cryomagma-inflated 'hot cross bun' feature and anomalous midlatitude ridges that may be paleodunes from a different climate epoch.
The accumulating body of topographic data from altimetry and SARtopo has permitted the assembly of a global topographic map (albeit substantially interpolated) and an estimate of the spherical harmonic shape out to degree $\sim$12. These datasets will be of substantial value in interpreting Titan's structure and geology, and as a boundary condition on global circulation models and fluvial studies. The growing number of overlap regions also permits stereo topography on smaller scales (e.g. of impact structures Ksa and Soi) which helps to understand the processes obliterating craters on Titan.