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Cassini RADAR at Titan : Results in 2014/2015

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Since the last EGU meeting, two Cassini flybys of Titan will have featured significant RADAR observations, illuminating our understanding of this enigmatic, complex world and its hydrocarbon seas in particular.
T104, which executed in August 2014, featured a nadir-pointed altimetry swath over the northern part of Kraken Mare, Titan's largest sea. The echo characteristics showed that the sea surface was generally flat (to within a few mm), although a couple of areas appear to show some evidence of roughness. Intriguingly, altimetry processing which yielded (Mastrogiuseppe et al., GRL, 2014) the detection of a prominent bottom echo 160m beneath the surface of Ligeia Mare on T91 failed to yield a similar echo over most of Kraken on T104, suggesting either that Kraken is very deep (perhaps consistent with rather steep shoreline topography) or that the liquid in Kraken is more radar-absorbing than that in Ligeia, or both. The absorbing-liquid scenario may be consistent with a hydrological model for Titan's seas (Lorenz, GRL, 2014) wherein the most northerly seas receive more 'fresh' methane input, flushing ethane and other lower-volatility (and more radar-absorbing) solutes south into Kraken.
T108, the last northern seas radar observation until T126 at the very end of the Cassini tour in 2017, is planned to execute on 11th January 2015, and preliminary results will be presented at the EGU meeting. This flyby features altimetry over part of Punga Mare, which will provide surface roughness information and possible bathymetry, permitting comparison of nadir-pointed data over all of Titan's three seas (Ligeia on T91; Kraken Mare on T104). The flyby also includes SAR observation of the so-called Ligeia 'Magic Island', the best-observed of several areas of varying radar brightness on Titan's seas. This brightness may be due to sediments suspended by currents, or by roughening of the surface either by local wind stress ('catspaw') or non-local stress (wind-driven currents).
SAR imaging and altimetry over land areas on T104 and T108 will be reviewed (current flybys devote more close-approach time to altimetry, in part because of solar heating pointing constraints for other Cassini instruments), and selected interpretations and products of earlier coverage will be discussed.