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New Results on the Titan Ionosphere from Cassini Radio Occultations

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Previous Cassini radio occultations, which provided measurements of the vertical electron density profiles in the Titan ionosphere, were conducted on March 26 and May 28, 2006, and March 19 and May 20, 2007 (Kliore,A.J., et al. (2008), J. Geophys. Res., 113, A09317, doi:10.1029/2007JA012965)The 3006 observations probed the Titan ionosphere at low- to mid-Southern latitudes, while the 2007 measurements were made at North and South polar latitudes. In all cases the main ionization peak was observed near 1,200 km. altitude. The peak density of the low-latitude observations ranged from about 1,400 /cc near the dawn terminator to 1,800 /cc on the dusk side. At polar latitudes, the peak densities from the March 19 observations were about 1,300 /cc, but 2,800 /cc in the May 19 measurements,which also showed large lower peaks (1,200 - 2,900 /cc) at about 500 km.
During the ongoing Cassini Extended Mission, two more occultations on Nov. 5, 2008 and April 4, 3009 provided data at northern m-d-latitudes and the equatorial region, as well as diverse magnetospheric ram angles different from those of the previous measurements, which elucidates the role of the Saturn magnetosphere in producing the Titan ionosphere.
This work was performed at the jet Propulsion Laboratory, California Institute of Technology, and at the University of Michigan under NASA contracts.