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The magnetotail of Titan

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Titan orbits Saturn at 20 Saturn radii and mostly inside the Saturnian magnetospheric plasma. When the magnetospheric corotating plasma encounters Titan's ionosphere, the plasma slows down and deflects while the magnetic fields pile up and drape around the moon, forming a magnetotail in the downstream. The Cassini spacecraft flew through Titan's magnetotail at several downstream distances, from near the surface to over 5 Titan radii. These observations reveal that the magnetotail has two lobes separated by a central current sheet. The lobe fields connect to the upstream ionosphere and may provide escaping channels for the ionospheric plasma. The thickness of Titan's magnetotail current sheet varies with distance downstream from Titan, with the current sheet being very thin near 2 Titan radii and getting thicker with distance. The magnetic field observations indicate the fieldlines draping around Titan become anti-parallel in the downstream near tail and may reconnect. The magnetic field and plasma data are jointly examined to determine whether the strongly draped fields reconnect in the tail. The multiple passes through Titan's magnetotail at varying distances that are now available contribute greatly to our understanding of this important feature of Titan's interaction with the corotating plasma.