Cassini observations of magnetic holes in the solar wind and Saturn magnetosheath

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We present the first Cassini observations of magnetic holes on the near-Saturn solar wind and magnetosheath, based on data from the MAG magnetometer. We conclude that magnetic holes (defined as isolated decreases of at least 50\% compared to the background magnetic field strength) are common in both regions. We present statistical properties of the magnetic holes, including scale size, depth of the magnetic field reduction, orientation, change in magnetic field direction over the holes, and solar cycle dependence. For magnetosheath magnetic holes, also high-time resolution density measurements from the LP Langmuir probe are available, allowing us to study the anti-correlation of density and magnetic field strength in the magnetic holes. We compare to recent results from MESSENGER observations from Mercury orbit, and finally discuss the possible importance of magnetic holes in solar wind-magnetosphere interaction at Saturn.

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