

Plasma composition near Enceladus

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During the first year of its orbital tour of Saturn the Cassini spacecraft performed three close flybys of the icy satellite Enceladus: on February 17, 2005 (1263 km closest approach altitude at 6.7 km/s), on March 9, 2005 (504 km closest approach altitude at 6.6 km/s) and July 14, 2005 (172 km altitude at 8.2 km/s). The Cassini Plasma Spectrometer (CAPS) on board the spacecraft measured plasma fluxes and ion composition in the vicinity of Enceladus during these flybys. The Ion and Neutral Mass Spectrometer (INMS) also measured neutral and ion fluxes. The primary ionized constituents observed are the so-called water-group ions, presumably the result of various electron impact, ion-molecule and solar UV induced reactions with water vapor evolved from icy surfaces. We also identify O_2^+ , C^+ , and N^+ . If CH_4^+ and NH_3^+ are present they are very minor species. We will discuss some of the probable chemical processes involved.