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Outflow and plasma acceleration in Titan's induced magnetotail

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Abstract

Plasma wave and particle observations are combined with the magnetometer measurements to investigate Titan's induced magnetosphere. Voyager and Cassini observations revealed a cold and ionospheric plasma in Titan's far and mid-tail region [1, 2, 3, 7]. Heavy ions have been reported in this region [4, 5]. In this study, we report on outflow and plasma acceleration in Titan's induced magnetotail for the T40 flyby. In the tail region, RPWS observations indicate a region of cold plasma from 0.1 to few tenth of electron per cubic centimeter. In the same time CAPS-IMS suggest the presence of ionospheric ions with a mass ranging from 15 to 29 amu, in agreement with INMS observations at lower altitudes [6]. A progressive acceleration of the ionospheric plasma is shown by CAPS. The bulk speed of this plasma is close to the local Alfvén speed suggesting an acceleration related to magnetic tension forces.

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