Geophysical Research Abstracts
Vol. 17, EGU2015-6105, 2015
EGU General Assembly 2015

Plasma regions and charged dust around Enceladus

Ilka A.D. Engelhardt (1,2), Jan-Erik Wahlund (1), David J. Andrews (1), Anders I. Eriksson (1), Shengyi Ye (3), William S. Kurth (3), Donald A. Gurnett (3), Michiko W. Morooka (4), and Michele K. Dougherty (5)

(1) Swedish Institute of Space Physics, Uppsala, Uppsala, Sweden (ilka.engelhardt@irfu.se), (2) Department of Physics and Astronomy, Uppsala University, Uppsala, Sweden (ilka.engelhardt@irfu.se), (3) Department of Physics and Astronomy, University of Iowa, Iowa City, USA (shengyi-ye@uiowa.edu), (4) Laboratory for Atmospheric and Space Physics, University of Colorado Boulder, Boulder, USA (Michiko.Morooka@lasp.colorado.edu), (5) The Blackett Laboratory, Imperial College London, U.K. (m.dougherty@imperial.ac.uk)

We are presenting characteristics of plasma and dust regions around Saturn's moon Enceladus with data from several instruments on board Cassini; the Langmuir probe and the electric antenna connected to the wideband receiver of the radio and plasma wave science (RPWS) instrument package and the magnetometer (MAG). Three main plasma and dust regions around Enceladus have been observed. One is the plume which is filled with neutral gas, plasma and charged dust. Then there is a dust tail on the downstream side of Enceladus and a dusty edge region around the plume. In these regions, the dust is in equilibrium with the surrounding plasma and gets charged by attracting free electrons. Sizes of the smallest dust particles are found to be of 10 nm in the dust tail region and the plume edge whereas inside the plume even smaller particles of only 1 nm in size are inferred. The dust distribution follows a simple power law. The charged dust also affects the Alfvén wings and they are asymmetric in the north south direction.