Geophysical Research Abstracts
Vol. 14, EGU2012-13487, 2012
EGU General Assembly 2012

Distribution and dynamics of dusty plasma in plumes of Enceladus

J.-E. Wahlund (1), A. I. Eriksson (1), M. W. Morooka (1), G. Hospodarsky (2), and W. S. Kurth (2)
(1) Swedish Institute of Space Physics, Uppsala Division, Uppsala, Sweden (jwe@irfu.se), (2) University of Iowa, USA

Previous reported observations by the Radio and Plasma Wave Science (RPWS), including interferometry of plasma density inhomogenities (δn/n), revealed that dust-plasma interactions takes place in the plasma disk surrounding the E-ring of Saturn, as well as within the dusty plumes of Enceladus. We now present new interferometry measurements from the dust-plasma plumes of Enceladus, as well as RPWS Langmuir probe observations from several Enceladus encounters characterizing the thermal plasma densities, sub-micron sized dust density and the ion drift speeds there. In the Enceladus plume both the ion and electron densities becomes very large (up to 10(4)-10(5) cm-3), but the number density of the electrons are still significantly lower than the ion number densities. Charged dust must therefore be substantial in the plume region. The plume plasma is conductive and we discuss the dust-plasma interaction and possible electrodynamics in the plasma disk near the E-ring and the plume of Enceladus.