EPSC Abstracts,
Vol. 4, EPSC2009-174, 2009
European Planetary Science Congress,

Adapting Cassini-CDA observation strategy to ISD detection in the Saturnian System

V. Sterken (1,2), N. Altobelli (3), S. Kempf (1,2), R. Srama (1,4), E. Grün (1,5) and G. Schwehm (3)

(1) Max Planck Institüt für Kernphysik, Germany, (2) Universität Braunschweig, Germany, (3) European Space Agency ESAC, Spain, (4) Universität Stuttgart, Germany, (5) Univerity of Colorado, US (veerle.sterken@mpi-hd.mpg.de / Fax: +49 6221 516660)

Abstract

Interstellar dust (ISD) is - together with various interplanetary particle (IDPs) populations of the zodiacal cloud - an exogenous pollutant, likely to alter the compositional properties of Saturn's main rings. Being able to derive the flux of ISD particles, in-falling onto Saturn's main rings, will help constraining the scenarios of ring evolution.

In addition, future ISD measurements are extremely valuable to extend the existing limited data set of ISD grain detections within the solar system. Detected first in 1993 by Ulysses [1], measurements at various locations of the solar system are necessary to understand how the dynamics of ISD is affected by solar radiation pressure and the interplanetary magnetic field.

The Cassini dust detector [2] is best suited for this study as the instrument benefits from the long integration time in the Saturnian system. One major difficulty though is to be able to distinguish ISD impactors from the local dust population. Predictions for impact velocity on the spacecraft and particle local volume density are made, using both theoretical propagation of the equation of motion and analytical approximations. These results shall help both analyzing past data and optimizing future CDA observations.

References

[1] Grün, E. et al. (1993), *Nature*, 362, 428–430.

[2] Srama, R. et al. (2004), *Space Science Review*, 114, 465–518.