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# Composition of Enceladus Plume and Surface Particles

**F. Postberg**(1), S. Kempf(1,2), R. Srama(1), J.K. Hillier (3), S.F. Green(3), N. McBride(3)

(1) MPI für Kernphysik, Saupfercheckweg 1, D-69117 Heidelberg, Germany; (2) Institut für Geophysik und extraterrestrische Physik, Universität Braunschweig,Mendelssohnstr. 3, 38106 Braunschweig, Germany ; (3) Planetary and Space Sciences Research Institute, The Open University, Walton Hall, Milton Keynes, MK7 6AA, U.K.

We report first results of the Cosmic Dust Analyser (CDA) after Cassini's spectacular Enceladus flyby only 50 km above the moons surface in March 2008. For the first time we acquire mass spectra of freshly ejected particles and intend to distinguish between different ejecta mechanisms. With a special instrument configuration we aim for a high spatial resolution to achieve a "compositional mapping" corresponding to different sources on the moons surface.
The moon is embedded in Saturn's tenuous E-ring. From previous CDA investigations of E-ring particles it is known that its dust population is dominated by tiny water ice particles. Two water-rich sub-populations could be identified during the previous years: One consisting of almost pure water ice (Type I) and another with significant organic or silicious impurities (Type II). The impurities observed in E-ring Type II spectra favour Enceladus' cryovolcanic vents as their source. The pure water ice Type I spectra could also be the result of an impactor ejecta process where micro impacts onto the clean water ice surfaces of Saturn's inner moons release smaller particles feeding the E-ring.
The March 2008 flyby allows to test this hypothesis: During closest approach to Enceladus' surface the spacecraft travels outside the plumes and the dust flux should be dominated by impactor ejecta, thus Type I particles. As Cassini moves away from Enceladus it crosses the plumes and Type II particles should dominate if our assumptions are correct. In any case the spectra are likely to reveal further details of the non-water component in Type II spectra allowing insights into the moons highly dynamic

geophysics and geochemistry below the icy surface.