



The electro-static potential of E ring grains

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Cassini's Cosmic Dust Analyser (CDA) has the unique ability to measure in-situ the charge carried by dust grains in excess of about 1 micron. Using the grain sizes measured simultaneously with the grain charge, also the electrostatic potential of the grains can be determined. The potential of E ring grains primarily stems from the charge transfer between the ambient plasma and the dust and from the photoionisation due to the solar UV. in the presence of many dust grains, the charge on grains can be significantly reduced due to collective effects. Direct grain charge measurements offer a unique means to assess the dust plasma interaction in Saturn's E ring.

During the last 3 years the CDA charge detector obtained sufficiently large data sets during 5 spacecraft traversals of Saturn's shadow, where the grain charging is only due to plasma collection currents. We will present the dependence of the (shadow) potential on the distance to Saturn and will discuss the implications of the CDA data for the nature of the dust plasma interaction in Saturn's E ring.