

CONTROL ID: 1202172

TITLE: An Estimate of the Dust Pickup Currents at Enceladus

PRESENTATION TYPE: Assigned by Committee (Oral or Poster) [Invited]

CURRENT SECTION/FOCUS GROUP: SPA-Magnetospheric Physics (SM)

CURRENT SESSION: SM10. Moon-Magnetosphere Interactions Throughout the Solar System

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Title of Team:

ABSTRACT BODY: The electrodynamic environment at Enceladus is often assumed to be driven exclusively by ions produced from the moon's south polar plume. In this presentation, we demonstrate that acceleration of moon-originating submicron dust by the reduced co-rotating E-field is capable of creating a substantial current perpendicular to the magnetic field. This pickup current may be comparable to the ion pickup current, and may be large enough to deflect the local magnetic field. We will analyze observations

substantial current perpendicular to the magnetic field. This pickup current may be comparable to the ion pickup current, and may be large enough to deflect the local magnetic field. We will analyze observations from the Langmuir Probe that is a component of Cassini's Radio and Plasma Wave Science (RPWS) package, along with associated plasma waves that reveal electron concentrations. We will especially examine the observations from the 12 March 2008 spacecraft passage by the body, where the spacecraft was moving primarily southward taking it along-side the jet/plume emitted from the south pole of the moon. The region of dust pickup is found to originate about 3-5 Enceladus radii northward of the moon, and extends to at least 10 radii southward of the moon. We attempt to quantify the dust pickup current and describe the effect the current might have on the overall magnetoplasma and E-field environment in the vicinity of the body.

KEYWORDS: [6250] PLANETARY SCIENCES: SOLAR SYSTEM OBJECTS / Moon.

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Additional Details

Previously Presented Material: 0% Some material from internal Cassini MAPS meeting April 2011.

Scheduling Request: