Interplanetary dust between Jupiter and Saturn: preliminary results from the Cassini Cosmic Dust Analyzer. N. Altobelli (1) and M. Roy (2), S. Kempf (3), R. Srama (4), Georg Moragas-Klostermeier (5), E. Grün (6). (1) NASA/JPL 4800 Oak Grove Drive CA-91101 Pasadena USA nicolas.altobelli@jpl.nasa.gov, (2) NASA/JPL 4800 Oak Grove Drive CA-91101 Pasadena USA mou.roy@jpl.nasa.gov, (3) MPIK, Saupfercheckweg 1, 69117 Heidelberg, Germany sascha.kempf@mpi-hd.mpg.de, (4) MPIK, Saupfercheckweg 1, 69117 Heidelberg, Germany ralf.srama@mpi-hd.mpg.de, (5) MPIK, Saupfercheckweg 1, 69117 Heidelberg, Germany moragas@mpi-hd.mpg.de, (6) MPIK, Saupfercheckweg 1, 69117 Heidelberg, Germany/ HIGP university of Hawaii, Honolulu, USA eberhard.gruen@mpi-hd.mpg.de.

Introduction: We report in this work the preliminary analysis of the Cosmic Dust Analyzer (CDA) data, obtained when the Cassini spacecraft was between Jupiter and Saturn. The data cover the time period between the Jupiter fly-by and the Saturn orbit insertion (SOI).

Previous analysis: Until the Cassini mission, the only in situ dust detectors ever flown in this region were the Pioneer 10 and Pioneer 11 dust experiments. A nearly constant flux of interplanetary dust (IDP) about 10^-6/m^2/s was derived from the Pioneer instruments data outside the orbit of Jupiter [2]. Owing to the sensitivity of these instruments, only big particles (larger than 10 μm for Pioneer 10 and larger than 25 μm for Pioneer 11) could be detected. Three dust sources accounting for the measured flux beyond 5 AU were identified, involving short-period Oort cloud comets (retrograde particles with low inclination), short-period Jupiter-family comets (low eccentricities and inclinations) and Edgeworth-Kuiper belt objects (low eccentricities and inclinations) [4].

Preliminary results and goals of this work: The CDA is a more sensitive instrument and allows the detection of smaller grains. In particular, streams of high-velocity submicrometre-sized dust particles, originating from both Jupiter and Saturn [1,3] are detected far away from their source and contribute significantly to the data set. However, bigger IDPs on bound low-inclined orbits have been detected as well. A preliminary analysis suggests both prograde and retrograde trajectories for these grains. As Cassini was located downstream to the interstellar dust (ISD) flux, no ISD grains can be detected on this part of the Cassini trajectory since this would require the instrument pointing to be directed toward the Sun (forbidden configuration). The IDP flux values measured are compared with the values derived from the Pioneer IDP data. Furthermore, deriving the flux value in the vicinity of Saturn provides a lower estimate of the IDP contamination onto the Saturn dust rings.

References: