



A profile of the Io dust cloud and plasma torus as observed from Juno

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The Juno MAG investigation's dedicated star tracker, the Advanced Stellar Compass (ASC), has continuously monitored high energy particles fluxes in Jupiter's magnetosphere subsequent to Juno's orbit insertion on July 4, 2016. The ASC primary function is to provide an accurate inertial attitude reference, however, the most energetic particles in Jupiter's trapped population is capable of penetrating the radiation shield of the ASC where they are registered. Such particles have energy $>15\text{MeV}$ for electrons, $>80\text{MeV}$ for protons, and $>\sim\text{GeV}$ for heavier elements. With a sample cadence of 250ms, the ASC renders a detailed mapping of the trapped particles throughout space traversed by Juno. The particles travelling along the magnetic field lines crossing near the orbit of Io will be strongly influenced by interaction with any matter, moon, dust or plasma, which happens to be in their trajectory. The relativistic particle flux monitored, is highly relativistic, and has as such a modest retention time in any drift shell. The short lifetime of the trapped particles, and the constant scanning of field lines connecting to the Io environment enables a detailed profiling of the dust and plasma density, as well as the effect to/from Io itself. We present the measurement and their implications for the azimuthal and radial dust cloud and plasma torus.