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# Trapped particles around Jupiter detected by Advanced Stellar Compass

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The Advanced Stellar Compass (ASC), attitude reference for the MAG investigation onboard Juno, has continuously monitored high energy particles fluxes in Jupiter's magnetosphere since Juno's orbit insertion. The instrument performs this function by tracking the effects of radiation with sufficient energy to transit the instrument's radiation shielding. Particles that Juno ASC observes have energy >15MeV for electrons, >80MeV for protons, and >~GeV for heavier elements.

Completing 24 highly elliptical orbits around Jupiter, results in a fairly detailed mapping of the trapped high energy flux at up to 20 Jupiter radius distances.

Traveling at velocities close to the speed of light, electrons measured by the ASC, maintain the motion governed by the three adiabatic invariants: gyrating motion around the magnetic field line, a north-south magnetic pole particle bounce, and a charge dependent drift around the planet.

The bounce period is much smaller than the Jovian rotation period, and a large east-west drift component is caused by the magnetic field gradient. For these reasons, the drift shell description traditionally used for dipolar fields, are far from adequate to describe the behavior of energetic particles travelling close to Jupiter.

In this work, we present the distribution of the trapped high energy electrons around Jupiter. Furthermore, we have constrained the spatial extent of the stable trapped regions and are presenting the distinctive pitch angle and its correlation with "life" of a particle. At certain distances from Jupiter, pitch angle dependency is not as important to keep the particle trapped as is the injected energy. We also develop an adiabatic map which describes the radial bands for stable trapped particles as a function of the pitch angle and energy.