

Space Plasmas in the Solar System, including Planetary Magnetospheres (D)
Acceleration Processes in the Magnetosphere (D3.4)

THE RADIATION BELT STORM PROBES (RBSP) ENERGETIC PARTICLE, COMPOSITION, AND THERMAL PLASMA (ECT) SUITE: UPCOMING OPPORTUNITIES FOR TESTING RADIATION BELT ACCELERATION MECHANISMS

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The Radiation Belt Storm Probes (RBSP) mission will launch in late summer 2012 and begin its exploration of acceleration and dynamics of energetic particles in the inner magnetosphere. In this presentation, we discuss opportunities afforded by the RBSP Energetic Particle, Composition, and Thermal plasma (ECT) instrument suite to advance our understanding of acceleration processes in the radiation belts. The RBSP-ECT instrument suite comprehensively measures the electron and major ion populations of the inner magnetosphere, from the lowest thermal plasmas of the plasmasphere, to the hot plasma of the ring current, to the relativistic populations of the radiation belts. Collectively, the ECT measurements will reveal the complex cross-energy coupling of these colocated particle populations, which along with concurrent RBSP wave measurements, will permit various wave-particle acceleration mechanisms to be tested. We review the measurement capabilities of the RBSP-ECT instrument suite, and demonstrate several examples of how these measurements will be used to explore candidate acceleration mechanisms and dynamics of radiation belt particles.