

## **ENERGETIC ELECTRON LOSSES FROM THE RADIATION BELTS**

REINER FRIEDEL, Yue Chen and Tom Cayton

Los Alamos National Laboratory, NM 87544, USA

One of the controlling factors of the trapped energetic electron radiation belts are the loss processes in the form of precipitation to the atmosphere, magnetopause shadowing and outward diffusion. Precipitation is generally thought to be the result of wave-particle interactions with either whistler chorus or EMIC waves, or a combination of both. Theoretical work on EMIC processes have indicated that these waves can lead to strong diffusion for relativistic electrons ( $>500\text{keV}$ ) and these waves have been thought to be mostly responsible for losses in that energy range. We will present data here from energetic instruments at geosynchronous and GPS orbits and from the SAMPEX/NOAA missions at low Earth orbit that challenges this assumption, based on three observational pieces of evidence that seem to be inconsistent with the EMIC mechanism:

- a) In-situ data from the GPS constellation show loss events that can be rapid (on hour timescales) and that occur over a large range of L and energy at the same time.
- b) A detailed case study at GEO remains inconclusive in spite of much circumstantial evidence for EMIC loss processes and
- c) The statistical local time distribution of precipitation seen at LEO orbit does not support the EMIC process.

trapped, observations, EMIC

Reiner Friedel, MS D466 (ISR-1), Los Alamos National Laboratory,  
P.O.Box 1663, Los Alamos, NM 87544, USA,  
tel: +1 505 665 1936, fax: +1 505 665 7395,  
e-mail: friedel@lanl.gov