2013 Radiation Belts Workshop: Comprehending, Specifying and Forecasting their Dynamics

Sunday, 30 June 2013 - Wednesday, 3 July 2013

Island of Santorini, Greece (http://en.wikipedia.org/wiki/Santorini)

Scientific Programme

AP-9, AE-9 International Collaboration

The AE9/AP9 team has developed new climatology models of the trapped radiation environment near Earth. These models specify the spatial and temporal variation of the energetic plasma and radiation belts in a statistical manner suitable for use in developing satellite design specifications. The new models can be used to generate several kinds of environment specifications: total mission fluence for dose and displacement damage specifications, worst case short-term electron fluxes for internal charging specifications, and worst-case short-term proton fluxes for proton single event effects specifications. The AE9/AP9 team seeks to internationalize the model development to improve the quality and capability of the models. More information on the current state of the AE9/AP9 models can be found at the
LWS web site.

To obtain a copy of the model, contact:

Dr. Bob Johnston afrl.rvborgmailbox - at - kirtland.af.mil and CC

Dr. Greg Ginet gregory.ginet - at - ll.mit.edu

Specification Models of the Radiation Belts: Radiation Environment Data Analyses/Validation

This session addresses recent developments on radiation environment datasets, calibration techniques, empirical radiation belt models, the validation of radiation belt models and their implementation in engineering tools.

Industrial Splinter

The beta release of the AE-9/AP-9 models has created much interest in the engineering community.

This splinter will address from the engineering user point of view these new models, their characteristics, differences with the A*-8, use cases, experience and standardization issues.

Waves, Wave-Particle Interactions and Radiation Belt Dynamics

Wave-particle interactions cause electron acceleration, transport and loss in the radiation belts leading to variations in the trapped electron flux of up to five orders of magnitude. Periods of enhanced electron flux are potentially hazardous for satellites on orbit and depend on the complex interaction of electrons with several types of waves, including ultra-low frequency waves, electromagnetic ion cyclotron waves, whistler mode chorus and hiss, magnetosonic waves, and a variety of other waves. The properties of these waves vary considerably with geomagnetic activity driven by the solar wind interaction with the Earth’s magnetosphere, but the relative contribution of each type of wave to radiation belt dynamics is still very uncertain.

Here we invite presentations on waves and wave-particle interactions at all frequencies relevant to radiation belt dynamics, case studies, simulations and modelling studies where these interactions are included in global models and compared against satellite data. We encourage observational, modelling and theoretical papers utilising the latest satellite data, models and ideas. Papers on the first results of NASA's Van Allen Probes mission and from the MAARBLE and SPACECAST projects of the European FP7-Space program are especially welcome.