03 Web-based Radiation Tools and Information

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Spenvis

SPENVIS is ESA's SPace ENVironment Information System, a WWW interface to models of the space environment and its effects; including galactic cosmic rays, solar energetic particles, natural radiation belts, plasmas, gases, meteoroids and debris. Allows for aggregation of radiation sources from different models like NASA's solar particle predictions (ESP-PSYCHIC).

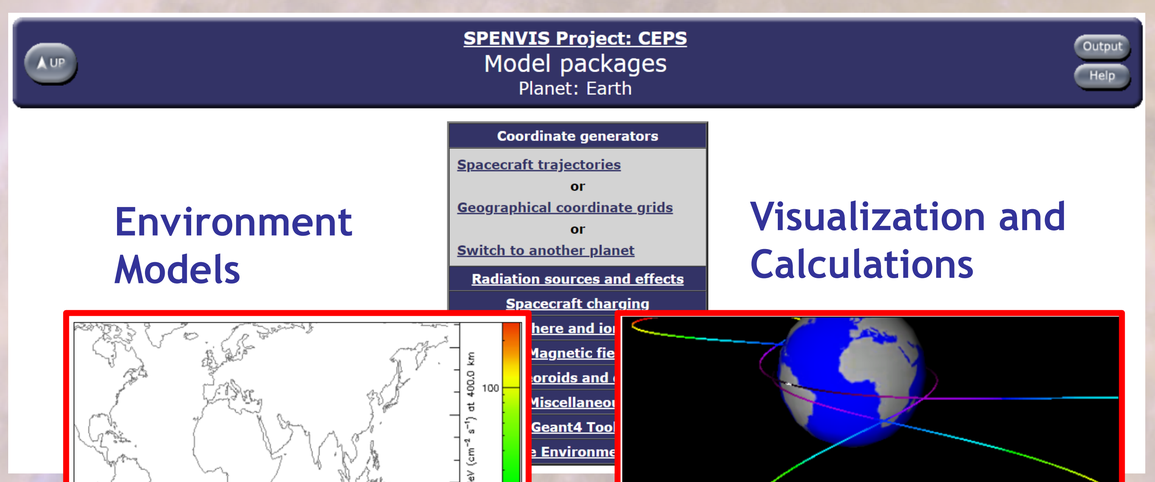

Fig. 1 – Particle flux in the South Atlantic Anomaly (SAA).

Fig. 2. Dose along custom orbits, trajectories, locations

CREME

The Cosmic Ray Effects on Micro-Electronics ('96 Revision) is a suite of programs for creating numerical models of the ionizing radiation environment in near-Earth orbits; evaluating the resulting radiation effects on electronic systems in spacecraft and in high-altitude aircraft; estimating the high LET radiation environment within manned spacecraft.

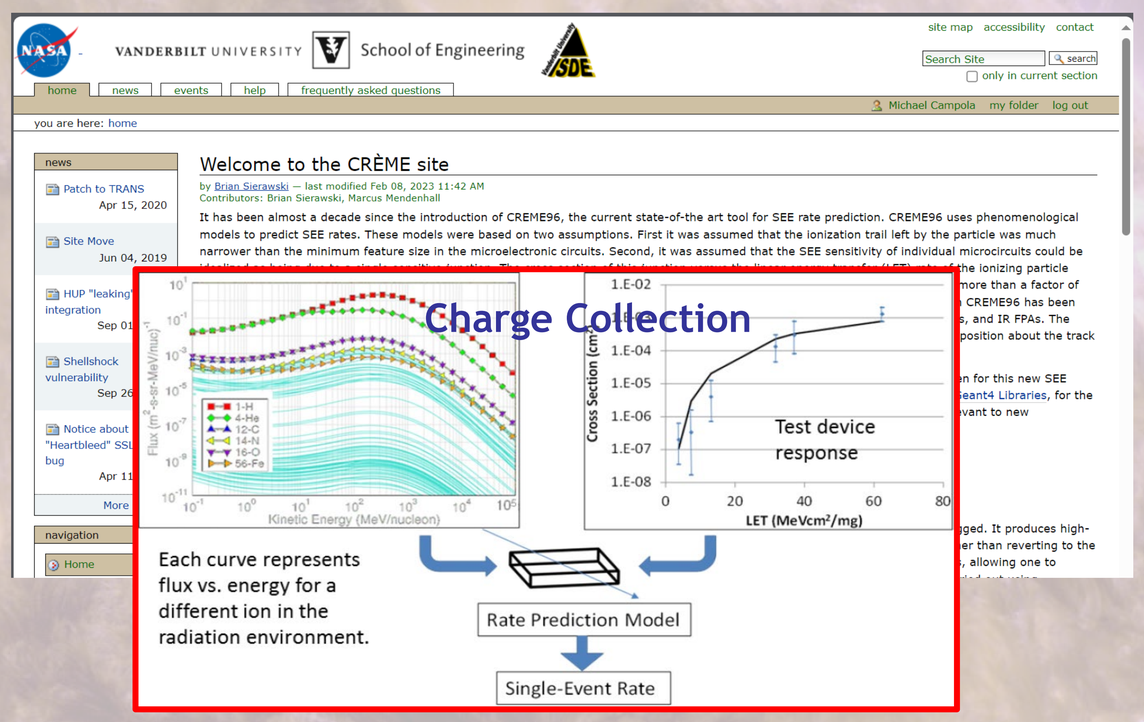

Fig. 3. Rectangular Parallelepiped charge collection model for single event effects rate predictions.

R-Gentic

Radiation GuidelinEs for Notional Threat Identification and Classification is a web-based tool that assists in providing guidance and an initial understanding of possible radiation risks that apply to a specific set of circumstances.

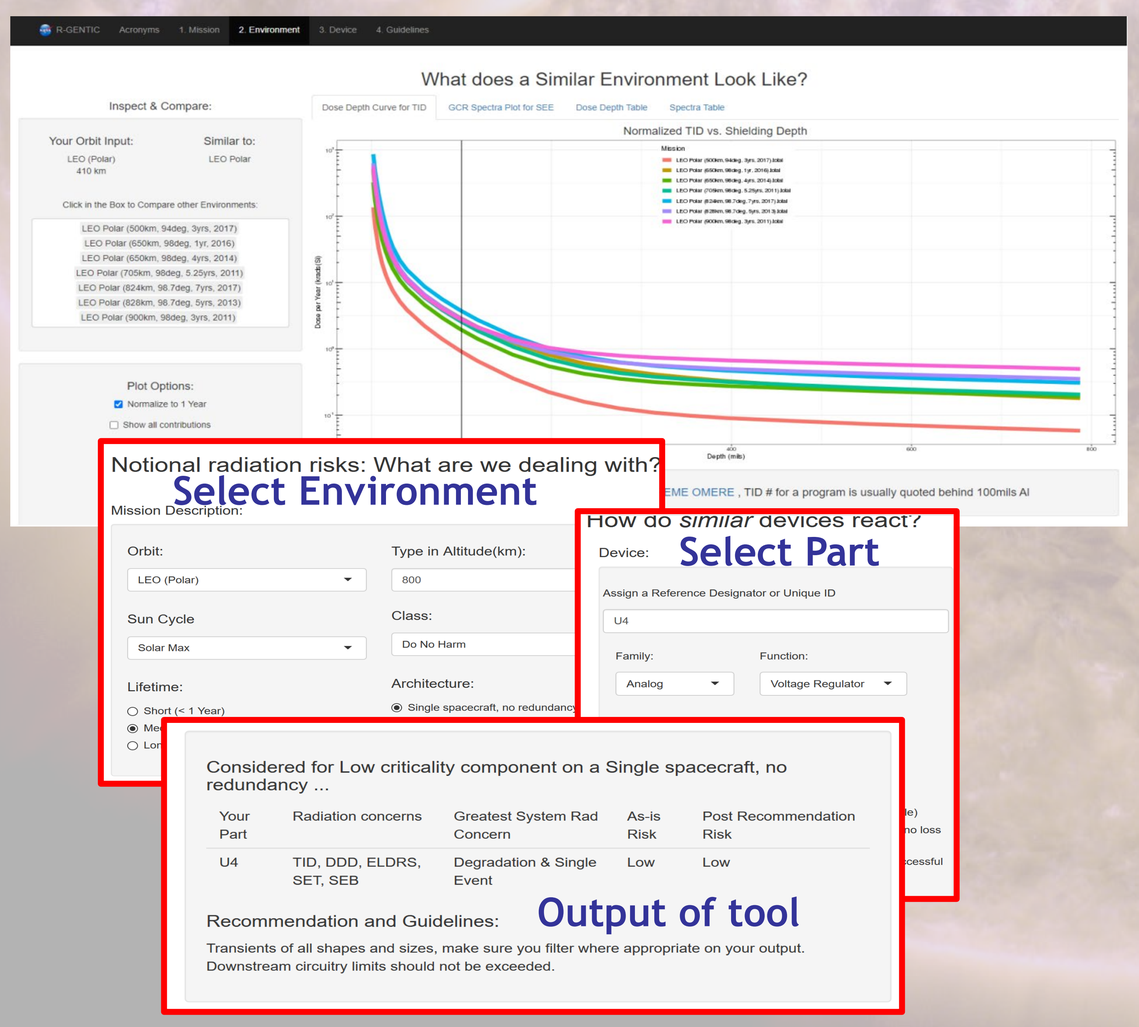

Fig. 4. SmallSat reactive code for education on radiation effects, pre-run environment models, part family susceptibilities and design architecture play a role in the outputs

SEAM

SEAM (Systems Engineering and Assurance Modeling) is a web-based collaborative modeling platform for modeling radiation assurance cases integrated with the models of the system. It is based on NASA's Reliability and Maintainability Standard.

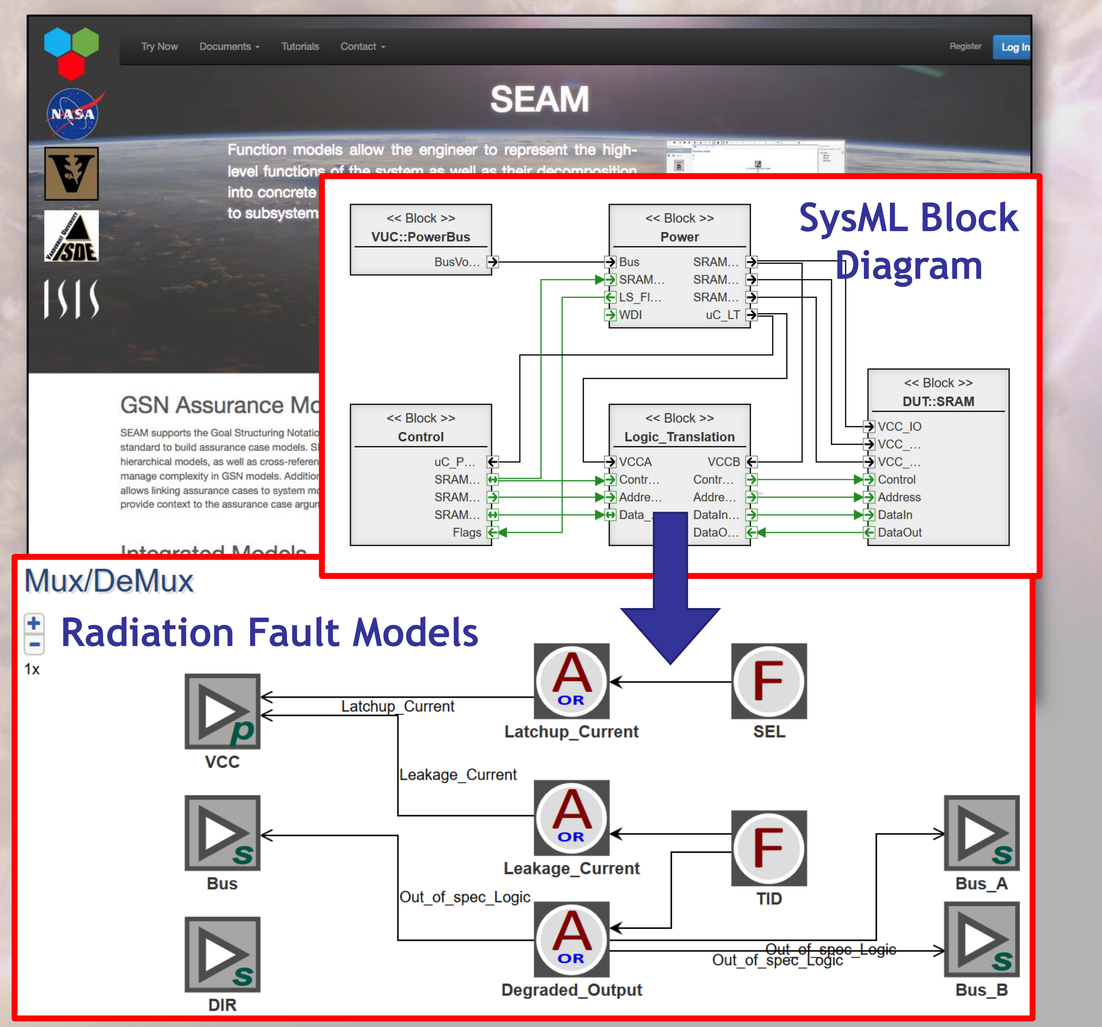

Fig. 5. Model-based mission assurance (MBMA) is an alternative to document-based mission assurance for establishing the risk and reliability of systems. It leverages block diagrams and fault trees that allow for easy visualization of requirements and fault propagation.