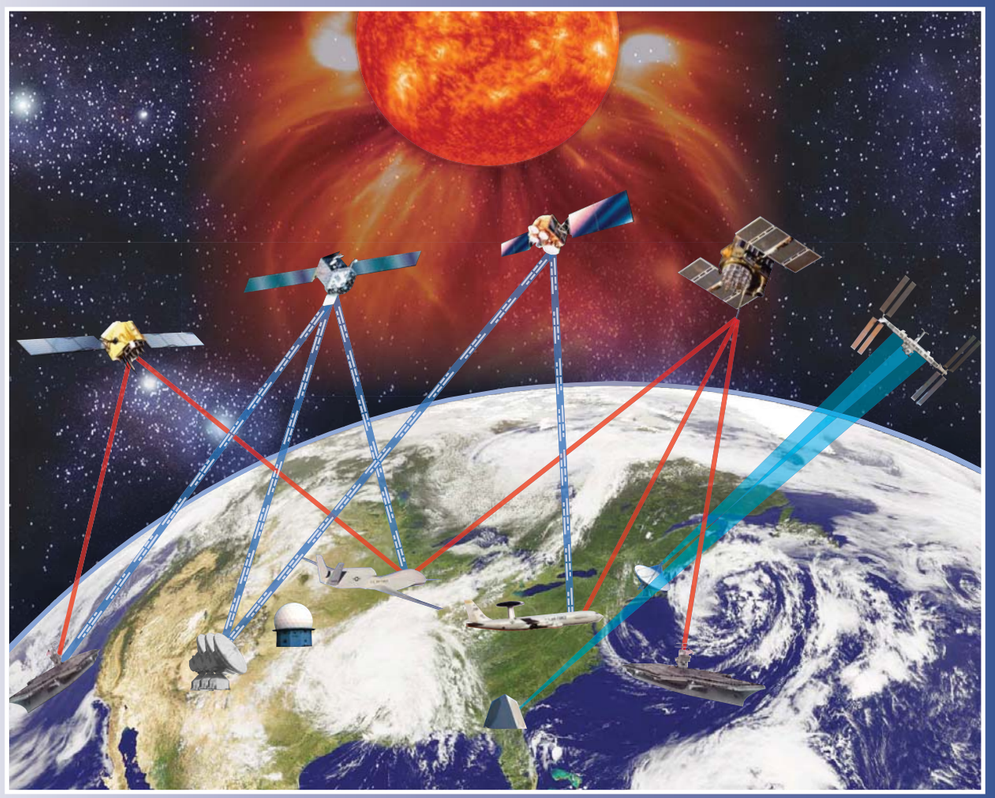
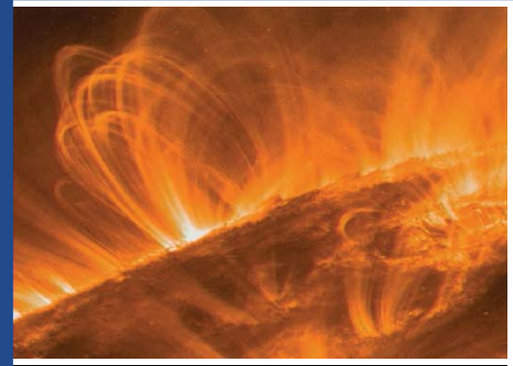


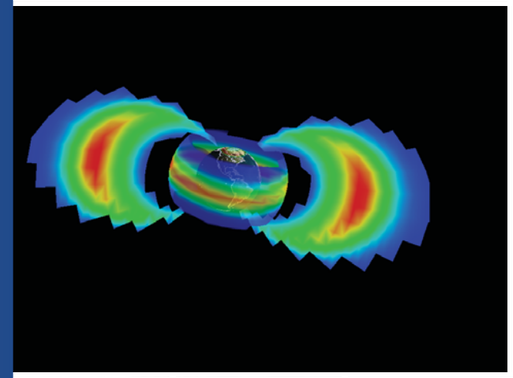
SEET

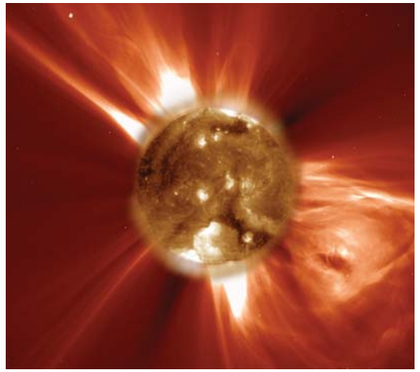
Space Environment and Effects Toolkit (SEET) for AGI's STK

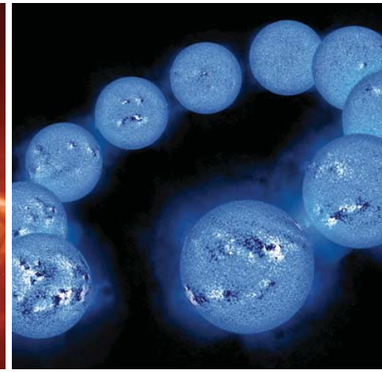
Design For The Most Likely Occurrence...

...Plan For Them All.









aer

SEET is based on Public Release Version 2.1P of the AF-GEOSpace software.
STK Software is a Copyright of AGI.

agi BUSINESS PARTNERS

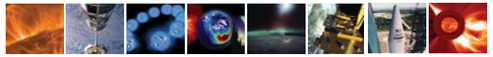
aer

Atmospheric and Environmental Research, Inc. (AER) has provided advanced science solutions for government and commercial applications since 1977. Our scientists' interdisciplinary expertise encompasses studies of the earth and its atmosphere and oceans, space, and the planets. AER's Space Weather and Effects Division provides data assimilative model development, integration, and validation for a broad range of space weather nowcast/forecast applications for assessment of environmental impacts on DoD and commercial satellites, sensors, and other technology assets in space.

www.aer.com

131 Hartwell Avenue • Lexington, MA 02421 • +1.781.761.2288 • marketing@aer.com

SEET



AER's Space Environment and Effects Toolkit (SEET) for AGI's STK

Whether you're doing trade studies, mission planning, or satellite design, or just contemplating the long-term impacts of the space environment on your spacecraft, AER's Space Environment and Effects Toolkit for AGI's STK provides the expert analysis tools you need. Designed by leading space physicists and derived in part from the [highly regarded] AF-GEOSpace code, SEET models the near-Earth space environment and its expected impacts on your space vehicle. Impacts resulting from short and long-term radiation damage effects, particle flux estimates and transit times through the SAA, probabalistic small meteorite and space debris damage, and mean vehicle temperature due to solar and reflected Earth radiation. Additional capabilities include model energetic particle flux and magnetic field distributions.

Robust Custom Handling of the Modeled Radiation Environment.

Know Your Radiation Environment

SEET provides the radiation dose information you need to model your equipment's performance degradation and its expected lifetime.

- Computes the expected dose rate and total dose due to energetic particle fluxes for your custom shielding thicknesses and materials for your custom orbit.
- SEET also calculates energetic proton and/or electron fluxes for a wide range of particle energies.
- You can choose from AFRL CRRES or NASA standard models or let SEET select the the best model for your specific orbit.
- Based on the latest AF-GEOSpace and NASA radiation belt models.

Estimate Mean Temperature Due to Solar & Reflected Earth Radiation.

Vehicle Temperature

With SEET you can produce a likely range of mean vehicle temperatures for your spacecraft and plan for those that impact its performance

- Compute estimate of mean vehicle temperature using thermal balancing equations for your custom orbit.
- Specify your satellites thermal properties and a range of Earth albedos and infrared radiation.
- Specify oriented planar or spherical objects.
- Based on standard NASA guidelines for orbiting environment characterization.

Compute SAA Transit Times & Probable Fluxes on Your Custom Orbit.

SAA Transit

With SEET you can mitigate the risk of Single Event Upsets and latch-up to your mission by estimating expected SAA entrance and exit times and knowing when to turn off or reboot your LEO spacecraft's sensitive electronics.

- Computes entrance & exit times through the South Atlantic Anomaly (SAA) enhanced region of ionizing radiation for your custom orbit.
- Calculates and displays SAA fluxes and/or flux contours for altitudes between 400 and 1600 km.
- Based on the latest AF-GEOSpace models.

Compute Magnetic Fields, Trace Fieldlines, and Determine Conjugacy.

Magnetic Field

Using a highly customizable set of conditions, SEET computes the local magnetic field at your satellite providing, among other things, information about its attitude along your specific satellite path.

- Compute the local vector magnetic field components and magnitude on your custom orbit or grid.
- Trace magnetic field lines, compute dipole or McIlwain L-shells, and/or compute footprints at any altitude surface.
- Determine when two satellites or a satellite and ground station are magnetically conjugate for your custom orbit.
- Uses the time-resolved IGRF main field model and a user-selectable external field: Olsen-Pfitzer, Hilmer-Voigt, or Tsyganenko. Simple, tilted, or tilted-offset dipole models based on the time-interpolated moments of the full IGRF model may also be specified. Based on the AF-GEOSpace implementations of the standard field models.

Predict the Likelihood of Damaging Meteorite or Space Debris Impacts.

Particle Impacts

Mitigate your risk of damaging impacts due to small particles and debris by using SEET to customize your spacecraft design and plan your orbit strategy prior to launch.

- Computes total probable mass distributions of all meteorites and space debris impacting your spacecraft for your custom orbit.
- Also computes the probable mass distributions for only those particles causing damage above your specified threshold.
- Define your own or select from SEET's lists of surface materials and properties Custom-design meteor storms to build worst-case scenarios.
- Meteor impacts algorithm based on AF-GEOSpace models.

Model Proton and Heavy Ion Fluxes, LET Spectra and associated SEU Rates.

Near Earth Heavy Ion Environment

Improve your spacecraft design and plan your mission more confidently using Single Event Upset (SEU) rate and Linear Energy Transfer (LET) spectra information customized for your specific location or orbit.

- Compute probabilistic fluxes, linear energy transfer (LET) spectra, and single event upset rates due to Galactic Cosmic Rays (GCR), Anomalous Component (AC), and Solar Energetic Particles (SEP).
- Specify target column density, mass density, device geometry, and upset cross-sections for SEU computation.
- Software includes a two-part shield and target spherical geometry model.
- Based on AF-GEOSpace models.