AE-9/AP-9 Radiation Belt Model
Release Notes

Version 1.20.001
May 16, 2014

Software Changes

- The available options for orbit definition were expanded, all of which are now supported by all three propagators.

- New run parameters were added for the selection/formatting specification of the time field(s), coordinate system and its units, and data delimiter characters used within the input and output files.

- A new run parameter was added for generation of output files containing the geomagnetic and adiabatic invariant coordinates for each ephemeris position.

- New parameters were added for performing unidirectional flux calculations using a list of pitch angle values, or file containing a time-dependent list of pitch angle values.

- The generated model run output files were enhanced with additional header information and expanded data value accuracy for most parameters.

- While the available parameters for the CmdLineAe9Ap9 application was expanded in this version, any model run input files that were produced for previous versions will still be able to generate the same form of results, provided that the model database file references are appropriately updated.

- Support for most of the newly-added CmdLineAe9Ap9 run parameters were also implemented within the GUI application.

- The GUI application was enhanced to provide the user to capability to specify the calculation of specific model (or aggregation) percentile values.

- The parameters in GUI application configuration file were expanded to include several GUI selection default settings.

- Issues with reading the TLE file orbital parameters when using the SGP4 propagator were resolved.

- The performance of the ShieldDose2 model calculations was improved.

- The internal ephemeris coordinate conversion calculations have been updated to improve their accuracy.

- The Linux-based build settings were revised to improve program execution performance.

- The C++, C and FORTRAN application programming interface (API) routines were revised to remove unneeded/unused arguments, change the coordinate system enumerations or string constants, and add new methods for the access to geomagnetic /adiabatic invariant coordinate values. An issue with the data order of multi-dimensional arrays for the FORTRAN interface was resolved.

- Support for 64-bit Windows was added.

- The CoordsAe9Ap9 utility was removed, as its capabilities have been superseded by the new 'adiabatic coordinates' features of the CmdLineAe9Ap9 and GUI programs, as well as new methods available in the API.

Database Changes

- [Description of database changes goes here…]

- The previous versions of the model databases are available, if desired. However, it is generally recommended that those be used with the model software release in which they are included.

Documentation Changes

- The AE9/APM/SPM Radiation Environment Model User's Guide was expanded with descriptions of the new software features, and clarifications of existing features. Appendix D was added to describe the internal Ae9/Ap9/SPM model coordinate systems, and the newly- accessible geomagnetic / adiabatic invariant coordinate parameters.

- The Application Program Interface was revised to reflect the expanded features for orbit definition, new options for specifying pitch angles for unidirectional flux calculation, and the new methods to access to the geomagnetic / adiabatic invariant coordinate values.

Contact Information

Please send any questions, comments and/or bug reports to
AFRL.RVBXR.AE9.AP9.Org.Mbx@us.af.mil