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SHIELDOSE/PC

Code System for Space Shielding Radiation Dose Calculation for PC

SHIELDOSE/PC evaluates the absorbed dose within a spacecraft due to a specified radiation environment as a function of depth in aluminum shielding material of spacecraft, given the electron and proton fluences encountered in orbit. It calculates, for arbitrary proton and electron incident spectra, the dose absorbed in small volumes of the detector materials Al, H2O, (tissue-equivalent detector), Si, and SiO2, in the following aluminum shield geometry's:

1) In a semi-infinite plane medium, as a function of depth;
2) At the transmission surface of a plane slab, as a function of slab thickness;
3) At the center of a solid sphere, as a function of sphere radius.

Such data are particularly suitable for routine dose predictions in situation where the geometrical and compositional complexities of the spacecraft are not known. Restricting consideration to these rather simple geometries has allowed for the development accurate electron and electron-Bremsstrahlung data sets based on detailed transport calculations rather than on more approximate methods.

SHIELDOSE/PC makes use of pre-calculated, monoenergetic depth-dose data for an isotropic, broad-beam fluence of radiation incident on uniform aluminum plane media. These data are in a scaled form so as to facilitate accurate interpolation used in the integration over the incident spectra. The conversion of slab dose to dose at the center of a sphere is done using a relation involving derivatives of the depth-dose curve, which is strictly valid only in a straight-ahead approximation. All the necessary interpolation and differentiation is accomplished through the use of natural-cubic-spline fits to the numerical data.

The quantity of interest calculated by **SHIELDOSE/PC** is the absorbed dose as a function of depth in an aluminum shield for an arbitrary incident fluence of radiation. The incident fluence can be either protons or electrons. If it is protons, it will be implicitly understood that the absorbed dose is the proton dose; if electrons, the absorbed dose is calculated separately for the Bremsstrahlung component and the "electron" component (i.e., the distribution of deposited electron energy never converted to Bremsstrahlung photons). Results are calculated for three geometries.

We at **Galaxy Advanced Engineering, Inc. (GAE)** have taken steps to make this code available on your PC platform or %100 compatible computers under PC/DOS or MS/Windows95/98/2000/XP/ME and NT operating system. To obtain the code and more information, please contact our company or call us at 650-740-3244.