NASA Space Radiation Risk Project: Overview and Recent Results

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The NASA Space Radiation Risk project is responsible for integrating new experimental and computational results into models to predict risk of cancer and acute radiation syndrome (ARS) for use in mission planning and systems design, as well as current space operations. The project has several parallel efforts focused on proving NASA's radiation risk projection capability in both the near and long term. This presentation will give an overview, with select results from these efforts including the following topics: verification, validation, and streamlining the transition of models to use in decision making; relative biological effectiveness and dose rate effect estimation using a combination of stochastic track structure simulations, DNA damage model calculations and experimental data; ARS model improvements; pathway analysis from gene expression data sets; solar particle event probabilistic exposure calculation including correlated uncertainties for use in design optimization.