# An Empirical Model of Electron Flux from the Seven-Year Van Allen Probe Mission

*Christine Gabrielse[1], James Roeder[1], Justin Lee[1], Seth Claudepierre[1,2], Drew L. Turner[3], T. Paul O'Brien[1], Joseph Fennell[1], J. Bernard Blake[1]

1. The Aerospace Corporation, 2. UCLA, 3. John Hopkins Applied Physics Lab.

The near-Earth radiation environment is a force to contend with when designing satellites and their instruments. Solar storms can accelerate and transport energetic particles closer to Earth, populating Earth’ s radiation belts and increasing a satellite’ s radiation dosage. A major application to the field of space weather is therefore knowing and understanding the near-Earth radiation environment. We use Van Allen Probe MagEIS and REPT data throughout mission lifetime to look at electron fluxes at different energies, pitch angles, and L shells, creating a daily average flux model that can be used to deduce what fluences were observed by any satellite that flew within Van Allen Probe’ s seven-year mission. We supplement Van Allen Probe fluxes with THEMIS statistical fluxes at higher L shells. This model can be applied to better understand satellite degradation issues related to the radiation environment. It is an improvement from previous empirical models in this regard by virtue of the fact that actual fluxes from a specific storm (or storms) can be deduced and compared to real satellite degradation data.

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