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Development of a new global radiation belt model

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The well known AP8 and AE8 NASA models are commonly used in the industry to specify the radiation belt environment. Unfortunately, there are some limitations in the use of these models, first due to the covered energy range, but also because in some regions of space, there are discrepancies between the predicted average values and the measurements. Therefore, our aim is to develop a radiation belt model, covering a large region of space and energy, from LEO altitudes to GEO and above, and from plasma to relativistic particles. The aim for the first version of this new model is to correct the AP8 and AE8 models where they are deficient or not defined. At geostationary, we developed ten years ago for electrons the IGE-2006 model which was proven to be more accurate than AE8, and used commonly in the industry, covering a broad energy range, from 1keV to 5MeV. From then, a proton model for geostationary orbit was also developed for material applications, followed by the OZONE model covering a narrower energy range but the whole outer electron belt, a SLOT model to asses average electron values for 2<L<4, and finally the OPAL model, which provides high energy proton flux values at low altitudes. As most of these models were developed using more than a solar cycle of measurements, these measurements being checked, cross calibrated and filtered, we have no doubt that the obtained averages are more accurate than AP8 and AE8 for these particular locations. These local models were validated along different orbit with independent data sets or effect measurements.
We will use a cache file system to switch between models, in order to obtain at each location in space and energy point the most reliable value. Of course, the way the model is developed is well suited to add new local developments or to include international partnership. The first beta version of this new Global radiation belt model will be presented during the conference.