

## **Characterization of Near Earth Radiation Environment by Liulin Type Instruments**

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Comprehensive study of the dose, flux and spectra from data obtained by Liulin MDU measurements on spacecrafts (4 different experiments) and aircrafts since 2001 is performed with the aid to understand how well these parameters can characterize the near Earth radiation environment. The value of the deposited energy where the maximum of spectrum is observed depends by the type and energy of the incoming radiation. Spectra generated by GCR protons or their secondary's are with linear falling form in the coordinates deposited energy/deposited dose. The position of the maximum of the spectra inside of the of South Atlantic anomaly region are in dependence of the incident energy of the incoming protons. Spectra generated by relativistic electrons in the other radiation belt have a wide maximum in the first 6 channels. For higher energy depositions the spectra are similar to the GCR spectra. Mixed radiation by protons and electrons and/or bremsstrahlung is characterized by spectra with 2 maximums. All type of spectra has a knee close to 6 MeV deposited energy, which correspond to the stopping energy of protons in the detector. Dose to flux ratio known also as specific dose is another high information parameter, which is giving through the Heffner's formulas the exact incident energy of the particles. New space research projects are also shortly presented.