Geophysical Research Abstracts
Vol. 20, EGU2018-9084, 2018
EGU General Assembly 2018

Simulation-regression strategy for interpreting LB1 sensor measurements

Richard Marchand and Pedro Resendiz
University of Alberta, Physics, Edmonton, Canada (richard.marchand@ualberta.ca)

An approach is presented for interpreting low level (LB1) satellite particle sensor measurements from a data base of simulation results and regression techniques. This approach is meant to be an improvement over most current methods currently used for interpreting sensor measurements, which are essentially all based on analytic expressions. While fast and well adapted to real-time operation mode, analytic models are limited in their capacity to account for effects encountered in situ, such as those associated with magnetic fields, deflection and obstruction of particles by nearby satellite components, photoelectron and secondary electron emission. These effects and more however, can readily be included in advanced three-dimensional simulations of satellites and their instruments. Simulations, however typically require run times and considerable computing resources, which prevents their direct use in sensor interpretation in a way similar to that of analytic models. By constructing a data base of simulation results encompassing the range of space plasma parameters expected in a mission, and by using a suitable regression technique, it should be possible to improve the interpretation of low level sensor measurements. Example simulation results are presented, and applications of the approach are illustrated with simple satellite and sensor geometry.