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Prediction of Geospace Radiation Environment and Solar Wind Parameters

Michael Balikhin (1), Tony Arber (2), Robertus Erdelyi (1), Natalya Ganushkina (3), Bart van der Holst (4), Vladimir Krasnoselskikh (5), Michael Liemohn (4), Ivan Pakhotin (1), Yuri Shprits (6), Simon Walker (1), Magnus Wik (7), Peter Wintoft (7), and Vitaliy Yatsenko (8)

(1) University of Sheffield, United Kingdom (m.balikhin@fgooglemail.com), (2) University of Warwick, Coventry, UK (T.D.Arber@warwick.ac.uk), (3) Finnish Meteorological Institute, Helsinki, Finland (nataly.ganushkina@fmi.fi), (4) University of Michigan, Ann Arbor, Michigan, USA (bartvand@umich.edu, liemohn@umich.edu), (5) CNRS-LPC2E, Orleans, France (vkrasnos@cnrs-orleans.fr), (6) UCLA, California, USA/MIT, Massachusetts, USA/ Skoltech, Moscow, Russia (shprits@skolkovotech.ru), (7) Swedish Institute of Space Physics, Lund, Sweden (magnus@lund.irf.se, peter@lund.irf.se), (8) Space Research Institute, Kiev, Ukraine (vyatsenko@gmail.com)

Energetic electrons within the inner magnetosphere can cause both deep and surface charging of spacecraft operating at GEO and MEO orbits. Reliable forecast of the fluences of these electrons can assist in the mitigation of undesirable effects on spacecraft. Previous forecasts of these fluences exploited either system science or first principles based methodologies.
The first, system science approach provides accurate forecasts of electron fluxes but is limited to regions in which continuous data are available, i.e. GEO. The second, based on physical principles, provides good coverage throughout the whole inner magnetosphere but with significantly lower accuracy. The combination of both approaches, as used in the SNB3GEO electron flux model (which combines the data driven NARMAX and physical VERB models), can overcome many of the short comings of the two individual models, generating improved short term forecasts for the whose RB region. Long term RB forecasts require the estimation of solar wind parameters at L1 based on remote solar observations.

PROGRESS, a new Horizon 2020 funded project, aims to address these issues. This talk will provide a review of PROGRESS achievements, current status and aims for future development.