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Metrics and Validation Needs for Space Weather Models and Services (PSW.1)

DEFINING METRICS AND TRACKING PROGRESS FOR NEAR-EARTH PLASMA AND RADIATION ENVIRONMENT MODELING: HIGHLIGHTS FROM THE INTERNATIONAL FORUM ON SPACE WEATHER CAPABILITIES ASSESSMENT

Piers Jiggins, piers.jiggins@esa.int ESA ESTEC, Noordwijk, Netherlands

Yihua Zheng, yihua.zheng@nasa.gov NASA/GSFC, GREENBELT, Maryland, United States

Joseph Minow, joseph.i.minow@nasa.gov NASA Langley Research Center, Huntsville, Alabama, United States

Natalia Ganushkina, natalia.ganushkina@fmi.fi Finnish Meteorological Institute, Helsinki, Finland

Dave Pitchford, dave.pitchford@ses.com SES, Betzdorf, Luxembourg

Michael Xapsos, michael.a.xapsos@nasa.gov NASA Goddard Space Flight Center, Greenbelt, United States

Timothy Guild, timothy.guild@aero.org The Aerospace Corporation, Chantilly, Virginia, United States

Insoo Jun, insoo.jun@jpl.nasa.gov NASA Jet Propulsion Laboratory, Pasadena, California, United States

Joseph Mazur, joseph.mazur@aero.org The Aerospace Corporation, Chantilly, United States

W Kent Tobiska, ktobiska@spacenvironment.net Space Environment Technologies, Pacific Palisades, California, United States

Matthias M. Meier, matthias.meier@dlr.de DLR - Inst. of Aerospace Medicine, Koeln, Germany

Paul O'Brien, paul.obrien@aero.org The Aerospace Corporation, Houston, Texas, United States

Yuri Shprits, shprits@gmail.com German Research Centre for Geosciences, Potsdam, Germany

Maria Kuznetsova, maria.m.kuznetsova@nasa.gov NASA Goddard Space Flight Center/Heliophysics Science Division, Greenbelt, Maryland, United States

The international forum on space weather capabilities assessment aims to quantify scientific progress in the area of space weather. More specifically it aims to deliver a framework for the application of metrics in order to measure performance/progress of space weather modelling and to construct a library of metric and validation techniques which may be used thereby harmonizing comparisons and validations which are made. One of the working groups acting under this umbrella focusses on space plasma and radiation environments and effects. In this domain there are clearly established standards for defining an environment which spacecraft must survive. Each major agency has its own standards which drive requirements. This

is less mature in the domain of commercial aviation. The aim of the working group is to connect the space weather modelling community with experts on environment specification in order to define environmental quantities (scientific predictands) which are representative of the environment driving an effect thus addressing user needs. The effects covered by the working group include surface charging, internal charging, total (ionizing and non-ionizing) dose, single event effects and effects on aircraft. In addition to the scientific (or environmental) predictand an associated effect quantity (and associated timescale) is defined for which tools are readily available to transform quantities from the environment to the effect. Finally, a set of statistical metrics are defined to evaluate the accuracy of model outputs. The acceptance of quantities will simplify to task of space weather modelers in validating their model and provide an objective comparison between models to show which are more reliable for a given effect over a given timescale. This talk presents the progress of the working group thus far to define concrete quantities which shall constitute space weather metrics in this domain.