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PRediction Of Geospace Radiation Environment and Solar wind parameterS

Work Package 1
Management

Deliverable 1.3
Minutes of the Final Stakeholder Meeting

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Document Change Record

Issue	Date	Author	Details
1.0	2018-08-27	SNW	Initial draft
2.0	2018-08-27	SNW	Updates and corrections answering the points raised

Contents

Summary

As part of its management structure project, PROGRESS has set up a Stakeholder Advisory Board (SAB) to oversee the project activities from an industrial/commercial perspective. The SAB is tasked to provide feedback to the project as to how PROGRESS may tailor its activities to provide assets that could be employed within the fields of satellite manufacturing and operations that will lead to an enhancement in the operational planning/provision of services and also the forecast of the Space Weather environment.

This deliverable provides a summary of discussions with the Stakeholder Board members following the Final Review Presentations 2-3 August, 2018.

1   Introduction

This document forms Deliverable D1.3 of the Horizon 2020 funded project PROGRESS.

In order to obtain commercially/industrially related feedback on its activities the project PROGRESS set up a Stakeholder Advisory Board (SAB). The SAB is tasked to provide feedback to the project as to how PROGRESS may tailor its activities to provide assets that could be employed within the fields of satellite manufacturing and operations that will lead to an enhancement in the operational planning/provision of services and also the forecast of the Space Weather environment.

The composition of the SAB, as described at the project Kick-off Meeting (held in Brussels, 2015-01-12) was as follows:

- Project Coordinator/Manager
- Dave Pitchford - SES
- David Jackson - UK Met Office
- Maria Kuznetsova - NASA Coordinated Community Modeling Centre
- Jeurgen Volpp - ESA European Space Operations Centre
- Didier Mourenas - CEA
- Eamonn Daly - ESA

2   Comments/suggestions from Stakeholder Committee members

This document summarises the comments received from the members of the Stakeholder Committee at the end of the Project. These comments will be used to improve the contents and presentation on the web site. We are currently working on a set of answers and actions to these points.

2.1   Comments from David Jackson regarding the Orbit Tool

It certainly looks like this could be potentially interesting, and in particularly for potential projects with satellite operators.

Comment: The data are taken from VERB, which we don't currently use. is the code flexible enough to be adapted to use data rom other models (eg we currently receive data from the BAS Radiation Belt model)?

Response: It is certainly possible to switch data sources for the background electron fluxes. To do this it will be necessary to develop software to

- read and extract the relevant data from the BAS Radiation Belt model output files
- run the BAS Radiation Belt model if the appropriate files are not available

Comment: Is flux the right parameter of interest, or is fluence more of interest for satellite ops? Maybe both?

Response: The flux is presented to the user since this is directly available within the VERB output data files. New parameters such as the fluence (integraged flux) could, in principle, be added in a later release.

Comment: In what is presented there's no indication of reliability, since it's not easy to compare obs to random satellites. It would be interesting to compare to actual obs e.g. overplot compared to GOES? Could also be done with Metop SEM data, which we can access. Which energy levels are of most interest? I'm not sure of the range that VERB covers, or if you have run with a single energy per output, but it would be useful to be able to select energy level.

Response: VERB outputs the fluxes at energies in the range 0.01MeV to 24MeV depending upon radial distance. It is possible to directly compare the lower VERB energy channels with the upper channels available from the GOES satellite.

The energy ranges of interest depend upon the effects to be studied. Typically, this would include surface charging effects (energies of the order of a few 10's of keV) and internal charging (energies around a few MeV). Now that the IMPTAM data are online it should be possible to produce similar figures for lower energies.

2.2   Comments from Dave Pitchford regarding the Orbit Tool

Dave Pitchford expressed interest in the use of the Orbit Tool. He requested runs for three satellites NSS-803, SES-3 and AMC-7 for the same time period as was shown in the example plots that were circulated to the SHC. The sets of plots and text files output from the orbit tool were emailed to Dave.

2.3   Comments from Didier Mourenas regarding the web site in general

Overall, the results and their presentation are nice and should be very useful!

Please find below some comments on your nice new webpages:

Comment: In the "Current geospace environment" part, no access (yet) to "Calculation Method" of electron fluxes. It is very important to know what levels 1, 5, 9... mean in terms of actual fluxes.

Response: This particular link to the "Calculation method" should take you to the page describing the model, and reference any relevant papers. We are sorry that this is not available yet. We are currently correcting this problem.

Comment: I wonder why it cannot be written beside numbers what is their physical unit (flux in 10 to some power * e/cm2/s)

Response: In the latest version of the "Current Conditions" panel, the units of the quantities are specified. This information is currently being added to the pages containing the parameter descriptions.

Comment: Moreover, why are all AE values plotted along one vertical line – it seems to be a small bug, here.

Response: You are correct in specifying that this is a small bug in the software. The reason for this is that the system only requests a small number of the latest data points. This number will be increased in future to enable more data to be retrieved.

Comment: The units of GSO fluxes plotted should be $Log\_10(...)$. And why not use directly a logarithmic y-axis (with small bars for 2, 4, 6, 8 instead of the present one?, i.e., like the Narmax flux forecasts for example.

Response: The changes to the Y-axis (log scale rather than linear) would be a meaningful update to the plots. We intend to implement it, and also fix the axis limits as is currently done on the flux forecast plots.

Comment: The "Dst-Kp-AE forecasts" plots from Lund are very nice. Maybe the y-axis could be adapted automatically so that it would extend up to the maximum plotted value and not more, to better see the details.

Response: We agree that this may be an interesting idea. However, it is probably more useful to keep the fixed scale so that plots for different periods can be more easily compared. We feel that users who want to investigate the smaller fluctuations would prefer to download th data in order to play with it themselves. Thee data is available from either the PROGRESS web site or directly from the model developers site.

Comment: Why not use the same kind of plots for the "Sheffield Dst-Kp forecasts" as for Lund's plots ? Using similar plots is more nice and user-friendly than using different plots for each data or origin.

Response: This is certainly a good idea to create a more uniform look. We will look into the possibility of modifying he Sheffield forecast plots.

Comment: In the VERB result plots, I would replace the GOES-VAP panel by a panel showing a direct comparison of VERB and GOES flux levels, similar to the other forecasts plots (since VAP data will soon become unavailable in 2019). Or at least, you could add one panel showing this (the colored GOES line cannot be easily compared with the VERB plot above, due to the smallness of the panel)

Response: The VERB results are actually generated by our collaborators in UCLA. We will pass on you feedback to them.

Comment: In the VNC forecast plots, you could similarly add a panel showing VNC versus GOES data

Response: This would be a useful addition to the output and provide the user with more confidence in the results. Such plots were generated as part of the model validation process and could easily be added.

Comment: More problematic is the fact that at this time, your link http://ssl-progress.sheffield.ac.uk/ProgressLab/ is unfortunately not working... A message "(104) Connection reset by peer" appeared when I tried it several times today. Thus, I cannot provide any comment on this tool at this time.

Response: This problem should have been resolved. Access to the orbit tool should be possible from outside of Sheffield.