Splinter Session 5 Questionnaire

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Overview

- Questions for modellers
  - Data needs, access methods, integration of services in modelling tools
- Questions for service providers
  - Model and data usage, integration of online models in services, information on model uncertainties
- Questions for service users
  - Service usage, service features, value added by service providers
- Space weather catalogues
  - Catalogue usage and usefulness, catalogue content, features and availability, product listing
- Other comments
- 26 replies

Questions for modellers

- What are your data needs?
  - GOES particle and X-ray data
  - Magnetic indices, solar wind data
  - Particle fluxes in vicinity of Earth and on Earth surface from keV to GeV
  - Intensity of e- fluxes at L=3-5 (SAMPEX etc.)
  - Data from LANL: electrons, protons
  - Magnetic data from different regions of the magnetosphere (VLF range)
  - GNSS data from selected regions such as Europe
  - Available data are sufficient for TEC modelling, but insufficient for 3D modelling or modelling of small and medium scale structures

Questions for modellers

- Missing data
  - Databases on CMEs, p+ and e- fluxes
  - Equatorial ionosonde and magnetic field data
  - Heliocoordinates of ≥M class solar flares, velocities of CMEs; time history of X-ray and gamma ray bursts!
  - Atmospheric electricity variation data (lightning)
  - Permanent monitoring of EUV and X-ray full solar disc absolute fluxes
  - Fluxes of protons and electrons precipitating in the ionosphere
  - High frequency E field measurements for wave turbulence simulation
  - Directional (sectored) proton and electron fluxes at high time resolution
  - Ion data and multispacecraft observations of events
  - Data from hospital admissions and ambulance calls
  - Long term medical data on blood pressure, sudden death, strokes, ...
  - Equatorial ionospheric scintillation data (10-50 Hz)
  - Consistent data for flux enhancements in all regions of the magnetosphere
  - Continuous 1s monitoring of dayside magnetopause boundary layer
  - Online access to high cadence electric field measurements
  - Ozone and Earth temperature data
  - Solar wind and magnetic field data at L1

Questions for modellers

- Data access methods
  - Most access methods are user friendly. Personal contact with data producers is preferred.
  - Access through ftp, http, wget is sufficient.
  - Need for integration of all data on one server as plots and data files
  - Format converters are needed (e.g. for binary files)
  - Standard format of data files, including database description and missing value format
  - Data obtained from scientific journals and WDCs
  - Neutron monitor data from web sites
  - ftp access to all archives would be very welcome; ASCII and CDF are suitable
  - Central site with links to all space weather data bases and models is needed

Questions for modellers

- Integration of data services in modelling tools
  - Download of data and local storage in a data base
  - Data acquisition tools are being developed parallel to meteorological methods.
  - Parametrized data format converter to feed data into processing and visualization software
  - External help is needed!

Questions for service providers

- Which models do you use?
  - TEC models
  - Projective model of time series, decomposition by eigen basis, recursive algorithm for time series creation
  - SWPC is very interested in moving to physics based models: solar, heliospheric, energetic particles, geomagnetic, ionospheric
- Which models are missing?
  - Reliable inonospheric scintillation prediction model (2-48 hours) for vulnerability study of navigation and positioning system

Questions for service providers

- What are your data needs?
  - GOES, POES, ACE, SOHO, geomagnetic indices
  - MLSI, SECCHI
  - GPS measurements, provided by IGS and EUREF
  - Climax and ACE data, ground level neutron monitors (stations are disappearing)
- What data is missing?
  - Shumann resonance data, plc pulsation data
  - Data on strokes and cardiovascular disease over several solar cycles
  - GPS measurements with sampling rates of 1s or higher
  - Equtorial ionospheric scintillation data (10-50 Hz)

Questions for service providers

- Integration of online models into services
  - Integrating model output into existing space weather services is a very difficult problem. A very important missing component is the development of a space weather framework that is used in operations and can be used by the model developers. At present each model is developed independently with its own developement language. This makes the problem of transition to operations a much more difficult problem as each model has to be modified to work within the operational services.

Questions for service providers

- Information on and presentation of model uncertainties
  - In general, insufficient information is available. Standard metrics for model comparisons are required.
  - Error bounds of data products should be provided.
  - Severe model uncertainties exist in predictions of ionospheric scintillations.

Questions for service users

- Which services do you use?
  - SPENVIS, CDAWeb, ...
  - Cluster data from CSDS and CAA, Themis data
  - Izmiran neutron monitor data server
  - SPIDR
  - MLSO, SECCHI, SOHO FITS images
- Which additional services are needed?
  - No replies

Questions for service users

- Useful and missing service features
  - Solar Weather Browser, Festival
  - Cluster Active Archive does not have ftp access
- Do service providers add significant value to data and models?
  - No inputs through script error... Please provide...

Space weather catalogues

- Which catalogues do you use or know of?
  - I do not know which catalogues exist (2).
  - CDAWeb, OMNIWeb, SEC
  - CME catalogue for SOHO, STEREO; online synoptic maps; real time images
- Are catalogues useful?
  - Yes
  - Missing catalogues:
    - Solar wind and IMF data, CMEs, Forbush decreases, Shumann resonance data
    - Coronal holes

Space weather catalogues

- What information and features should catalogues provide? How should catalogues be distributed?
  - More information on existing catalogues is needed.
  - Catalogues should be available over WWW, and users should be able to download selected data.
  - Solar/interplanetary measurement list of individual space weather effects (communication dropouts etc.)
  - Better visibility of reference models
  - Description of the products and models, information about accuracy, resolution and reliability; distribution through space weather portals.
- Would you list your model or application in a catalogue? Preferred procedure?
  - Yes (4)
  - Catalogue of high speed streams in solar wind is posted in ESWEP via link to institute web site; efficient procedure.

Other comments

- There is a need for a virtual observatory on space weather, concentrating archives and on-line data on solar acivity, solar wind, magnetic storm indices, etc., guaranteeing good quality and easy access.
- Organization of a round table on space weather effects on living systems, including human health. This subject is neglected up to now by the community.