Development of a Space Weather forecast service

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Space weather describes changes in the near-Earth space environment, it includes the monitoring of magnetic fields, plasma, radiation and other matter. Ejections of plasma from the Sun and magnetic storms at the Earth can increase the number of high energy particles trapped in the Earth's magnetic field; these events can present risks and hazards to space-borne instrumentation and personnel.

Improved knowledge of space weather processes acquired through monitoring via both satellite and ground based instruments and related collaborative research projects (European Union Framework 7 – SPACECAST) has allowed the further development of forecasting models such as the British Antarctic Survey (BAS) Radiation Belt model.

A system is being developed which enables real-time access to a space weather forecast service. This service will provide a 3-hourly forward look, updated hourly. To enable this forecast, systems are in place to gather, in real-time, ancillary data required for input into the BAS model, in particular data from the GOES satellite instruments. Auxiliary information from other satellites (e.g. ACE) and ground based magnetometers are also gathered and presented to assist in the interpretation of current space weather activity. BAS is working in collaboration with satellite operators and other interested parties to provide an interface which will inform them, in a timely fashion, of events that may require mitigating action to prevent possible extensive (and costly) effects to, for example, communication services. Data can be obtained via a web service, or viewed directly via a browser interface. In addition, it is anticipated that a post-event analysis suite be available, enabling the more detailed view of recent and past events and the possibility of running the model to "replay" periods of space weather history.