



# **7TH EUROPEAN SPACE WEATHER WEEK**

**NOVEMBER 15-19, 2010  
BRUGES, BELGIUM  
[WWW.SIDC.BE/ESWW7](http://WWW.SIDC.BE/ESWW7)**

## **ABSTRACT BOOK**

**Research - Applications - Products - Services**

- Space Situational Awareness
- Space Weather in support of European critical infrastructure
- Spacecraft Environments and Effects
- New Techniques for Tracking Heliospheric phenomena
- Space Weather Fair: provider meets user
- Business meetings covering topics such as ground effects of space weather, ionospheric effects, direct effects of solar radio weather...

Local Organisation: SIDC, Solar-Terrestrial Centre of Excellence, Belgium



Finally, gaps in the measurement infrastructure will be addressed. New technologies for sensors and detectors as well as the use of previously unexplored locations (e.g. L5, L3) might help to close these gaps. A few examples on some current ideas will be given.

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**CINEMA/TRIO: A Three-Spacecraft Space Weather  
CubeSat Mission**

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CINEMA/TRIO (CubeSat for Ions, Neutrals, Electrons and Magnetic fields) is a mission of three identical CubeSats in high inclination low Earth orbits, carrying two instruments: a suprathermal electron, ion and neutral sensor (STEIN) and a magnetometer from Imperial College (MAGIC). The spacecraft will provide multi-point measurements of near -Earth space including: stereoscopic energetic neutral atom imaging of the ring current with 1keV energy resolution; direct measurement of ion precipitation in the auroral regions including pitch angle distributions, from just a few keV; full energy characterisation of electron microbursts; and high cadence measurements of magnetospheric waves and transients. The multi-point magnetic field measurements of CINEMA/TRIO will be an ideal test bed for space weather effects on data from ESA's upcoming SWARM mission. The mission is a collaboration of UC Berkeley, Kyung Hee University and Imperial College London and has received funding from the US National Science Foundation and Korea's World Class University programme; the first spacecraft is expected to launch in late 2011.

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**EISCAT\_3D: Development of a large Near-Earth Space  
monitoring System in Europe**

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EISCAT\_3D will be Europe's next-generation radar for studies of the high-latitude atmosphere and geospace, with capabilities going beyond anything currently available. The facility will consist of large phased arrays in three countries. Depending on funding, EISCAT\_3D will comprise tens of thousands, up to more than 100,000 antenna elements. The EISCAT\_3D design combines capabilities for volumetric imaging and tracking and aperture synthesis imaging, with improved sensitivity and transmitter flexibility. A minimum of five sites is envisaged, with receivers located around 120 km

and 250 km from the active site, providing optimal geometry for vectors in the middle and upper atmosphere. An active site comprising 16,000 elements will exceed the sensitivity of the present VHF radar by an order of magnitude.

In autumn 2009, a multi-national consortium made an application funding of a Preparatory Phase Project for large-scale infrastructures on the ESFRI Roadmap within the 7th Framework Programme. At the time of the 7th European Space Weather Week, this project entitled "EISCAT\_3D: A European Three-Dimensional Imaging Radar for Atmospheric and Geospace Research" has commenced and is in its second month. In addition, funding in excess of 1 MEUR has been granted on national level in Finland for crucial development work related to EISCAT\_3D. This funding will be used to build a VHF test site in Kilpisjarvi in summer 2011.

The poster presented here will summarise the development thus far and outline the plans for the development towards building this exciting new facility. We invite all interested parties to get in touch now and express their interests and indeed their requirements for this facility now, so that they can be taken into account by the planning team.

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**Effects of geomagnetic disturbances on Oktyabrskaya  
railway in Russia**

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Possible relationship of anomalies in the operation of railway (RW) automatic systems with geomagnetic disturbances has been investigated at the Oktyabrskaya railway running from St. Petersburg to Murmansk, Russia.

A response to the strongest magnetic storms has been found in the RW- automatic operation at some stations in the subauroral zone. Generation of telluric currents or GIC is concluded to be the reason for the effect. Besides global storms, magnetospheric substorms also seem significant for both the development of GIC and failures in automatic systems. Statistical estimations of the connection between magnetic disturbances and anomalies in the operation of RW-automatic systems have been made for the period 2002 - 2006.

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