

PLASMON

A new, ground based data-assimilative modelling of Earth's plasmasphere – a critical contribution to Radiation Belt modelling for Space Weather purposes

IN THE PLASMASPHERE, LOOKING FOR HIDDEN SECRETS

The security of space assets is affected by the high energy charged particle environment in Earth's radiation belts. The plasmasphere strongly impacts this environment, yet currently, we lack adequate knowledge regarding its structure. The PLASMON project attempts to uncover hidden properties of the plasmasphere.

During a geomagnetic storm, satellites and humans in space face grave danger. Such extreme space weather pose risks for Europe's space infrastructure. Pursuing security in space, enhanced space weather forecasting is a priority for the EU, which is determined to protect its growing space infrastructures, in particular the foreseen Galileo and GMES satellite constellations.

The PLASMON project represents a coordinated international effort undertaken by a consortium of world renowned scientific institutions from Europe, America, Africa and New Zealand, aimed at enhancing our understanding of Earth's plasmasphere.

Situated just underneath the magnetosphere in the upper atmosphere, the plasmasphere is a region that consists of low energy plasma. It is believed that the plasmasphere impacts the nature of wave activity in Earth's radiation belts, known as the Van Allen belts. During a geomagnetic storm the length and time during which space assets are endangered by radiation is determined by loss mechanisms, particularly the phenomenon of relativistic electron precipitation (REP) that are governed by the properties of the plasmasphere.

The PLASMON project therefore undertakes regular longitudinally-resolved measurements of plasmaspheric electron and mass densities, in an attempt to monitor the composition of the plasmasphere from Earth. Using a network of observation stations, operating in the ULF and VLF ranges and deployed worldwide, PLASMON attempts to pave the way for enhanced space weather forecasts needed to secure our space assets.



JANOS LICHTENBERGER
IS PROJECT COORDINATOR

QUESTIONS & ANSWERS

What do you want to achieve with this project?

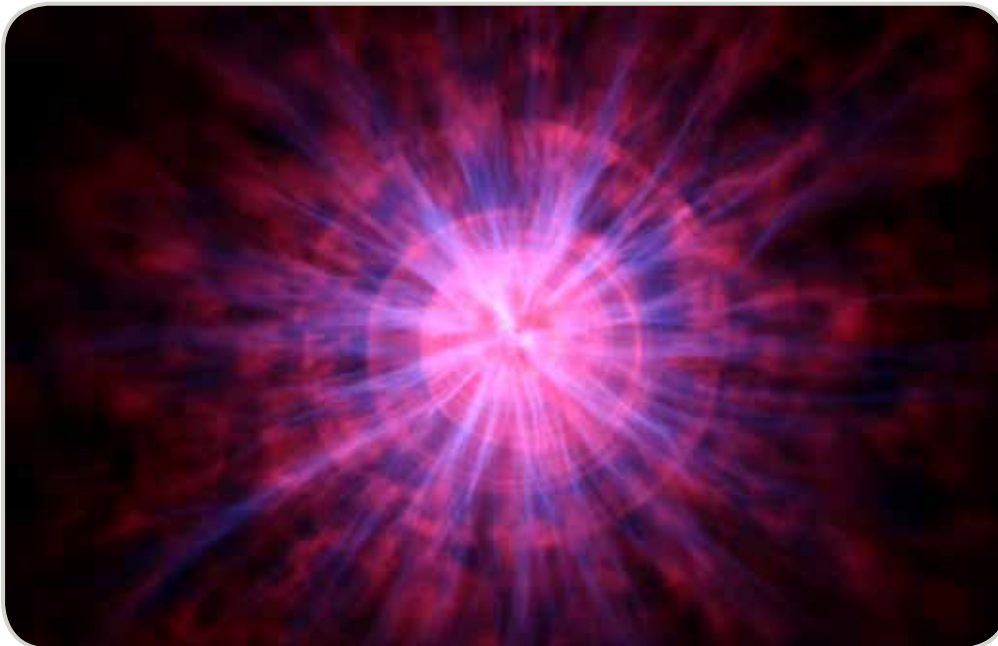
The main objective of PLASMON is to extend and fully establish the AWDANet, EMMA and AARDDVARK networks to provide real-time data for mapping and modelling the plasmasphere and the REP phenomenon in the Radiation Belts.

Why is this project important for Europe?

The modern civilization, including Europe relies on high tech satellite systems that are sensitive to the effects of Space Weather. EU – though it has an increasing number of satellites – has no own Space Weather forecasting service. PLASMON is intended to be an important step towards such a service.

How does your work benefit European citizens?

The European citizens' everyday life is invisibly shot by satellite technology – navigation, telecommunication, air travels, etc. –, the security and the smooth operation of this technology will be supported in the future by the results obtained in PLASMON project.



plasma ball © Schiller Renato - Fotolia.com

PLASMON will measure plasmaspheric electron and mass densities to monitor the changing composition of the plasmasphere.

PLASMON

A new, ground based data-assimilative modelling of Earth's plasmasphere – a critical contribution to Radiation Belt modelling for Space Weather purposes



LIST OF PARTNERS

- Eötvös Loránd University, Hungary
- Natural Environment Research Council, British Antarctic Survey, UK
- Eötvös Loránd Geophysical Institute, Hungary
- University of L'Aquila, Italy
- University of Oulu, Sodankyla Geophysical Observatory, Finland
- University of Otago, New Zealand
- National Research Foundation, Hermanus Magnetic Observatory, South Africa
- New Mexico Institute of Mining and Technology, USA
- Institute of Geophysics, Polish Academy of Sciences, Poland
- University of Washington, USA
- Los Alamos National Security LLC, USA

COORDINATOR

Eötvös Loránd University, Hungary

CONTACT

Dr. János LICHTENBERGER

Tel: + 36 1 3722934

E-mail: lityi@sas.elte.hu

PROJECT INFORMATION

A new, ground based data-assimilative modelling of Earth's plasmasphere – a critical contribution to Radiation Belt modelling for Space Weather purposes (PLASMON)

Starting date: 01/02/2011

Duration: 42 months

EU Contribution: € 1.972.050

Estimated total cost: € 2.626.263

