Advanced Thermosphere Modelling for Orbit Prediction

Fact Sheet

Project information

ATMOP

Grant agreement ID: 261948

Project website

Status
Closed project

Start date
1 January 2011
End date
31 December 2013

Objective

The ATMOP research project aims at building a new thermosphere model with the potential to spawn an operational version. It will enable precise air drag computation which is mandatory for improved survey and precise tracking of space objects in Low Earth Orbit and the initiation of appropriate measures to minimise risks to satellites (track loss, collisions) and ground assets (re-entry zone).

The state of the thermosphere can vary rapidly and significantly in response to solar and geomagnetic activity (space weather), i.e., accurate orbit prediction requires accurate space-time nowcast and forecast of the thermosphere. Despite the presence in Europe of one of the three groups that have the capability to develop and maintain an operational semi-empirical thermosphere model (CNES/CNRS, the other two are in the US), and of one of the world leading teams in the field of physical modelling of the atmosphere (UCL), Europe has currently neither a near-real-time thermosphere prediction model nor operational services to provide regular thermosphere nowcast and forecast.

The ATMOP project is designed to fill this gap through: Defining and assessing new proxies to describe the external forcing of the thermosphere; Developing an advanced semi-empirical Drag Temperature Model (DTM) that meets the requirements for operational orbit computations; Improving physical modelling of the thermosphere to assist the development of the advanced DTM and of a global physical model with data assimilation capabilities which may ultimately become the successor to semi-empirical models; and
Developing schemes for near-real-time assimilation of thermospheric and ionospheric data into an advanced predictive DTM and into the physical Coupled Middle Atmosphere-Thermosphere (CMAT2) model.
ATMOP therefore contributes to ensuring the security of space assets from space weather events (SPA.2010.2.3-01) and the development of the European capability to reduce dependence of space operations on the US.

Field of Science
/natural sciences/physical sciences/astronomy/planetary science/satellites
/social sciences/sociology/governance/public services

Programme(s)
FP7-SPACE - Specific Programme "Cooperation": Space

Topic(s)
SPA.2010.2.3-1 - Security of space assets from space weather events

Call for proposal
FP7-SPACE-2010-1
See other projects for this call

Funding Scheme
CP - Collaborative project (generic)

Coordinator
<table>
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<td>Administrative Contact</td>
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<td>Marta Díaz-Pavón Escavias De Carvajal (Ms.)</td>
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Participants (7)

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<td>Guillaume Boucherle (Mr.)</td>
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<td>Jean-Jacques Valette (Dr.)</td>
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