Advanced Thermosphere Modelling for Orbit Prediction

**Fact Sheet**

**Project Information**

<table>
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<tr>
<th>ATMOP</th>
<th>Funded under FP7-SPACE</th>
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<tbody>
<tr>
<td>Grant agreement ID: 261948</td>
<td>Overall budget € 2 217 243,16</td>
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*Project website* [🔗](#)

<table>
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<tr>
<th>Status</th>
<th>EU contribution € 1 563 980,36</th>
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<tr>
<td>Closed project</td>
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**Start date** 1 January 2011  
**End date** 31 December 2013

**Coordinated by**  
DEIMOS SPACE SOCIEDAD LIMITADA UNIPERSONAL  
Spain

**This project is featured in...**

**RESEARCH*EU MAGAZINE**  
Water of life: desertification, access to clean water

**NO. 21, APRIL 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)

Topic(s)

Call for proposal

FP7-SPACE-2010-1

Funding Scheme
### Coordinator

**DEIMOS SPACE SOCIEDAD LIMITADA UNIPERSONAL**

<table>
<thead>
<tr>
<th>Address</th>
<th>Activity type</th>
<th>EU contribution</th>
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<td>Private for-profit entities</td>
<td>€ 294 144,66</td>
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<tr>
<td>28760 Tres Cantos (Madrid)</td>
<td>(excluding Higher or Secondary Education Establishments)</td>
<td></td>
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<tr>
<td>Spain</td>
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</table>

**Website** [Contact the organisation](#)  

**Administrative Contact**

Marta Diaz-Pavón Escavias De Carvajal (Ms.)

### Participants (7)

**CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS**

**France**

<table>
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<td>€ 470 821,01</td>
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<tr>
<td>Rue Michel Ange 3</td>
<td>Research Organisations</td>
</tr>
<tr>
<td>75794 Paris</td>
<td></td>
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**Website** [Contact the organisation](#)  

**Administrative Contact**

Guillaume Boucherle (Mr.)

**COLLECTE LOCALISATION SATELLITES**

**France**

<table>
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<td>11 Rue Hermes</td>
<td>Private for-profit entities</td>
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<tr>
<td>31520 Ramonville St Agne</td>
<td>(excluding Higher or Secondary Education Establishments)</td>
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</tbody>
</table>

**Website** [Contact the organisation](#)
MET OFFICE
United Kingdom
EU contribution
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Activity type
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Research Organisations and
Secondary or Higher
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Website
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Education Establishments
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Administrative Contact
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KYBERTEC S.R.O.

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EU contribution
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(excluding Higher or Secondary Education Establishments)

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Administrative Contact
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KONINKLIJKE STERRENWACHT VAN BELGIE

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Last update: 26 May 2017
Record number: 96984

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