Atmospheric Effects Topical Group

Reporting period: 2012 – June 2013

1. FP7 project ATMOP
2. ESA/STSE: GOCE density and wind products

ATMOP

Advanced Thermosphere Modelling for Orbit Prediction

Space Call 3 – FP7-SPACE-2010-1

http://www.atmop.eu/

ATMOP Work package 4*:*

Semi-empirical modelling of the thermosphere

The DTM2012 semi-empirical thermosphere model has been constructed in 2012. This is an intermediate model in the development of DTM2013, which will be developed using a new solar proxy and the geomagnetic index am (the newly developed index not being ready in time for the model).

DTM2012 is an update, essentially fitted to a larger data base, of DTM2009; DTM2013 will use more data still, in particular low-altitude GOCE densities, as well as a different solar proxy.

DTM2013 will be released in November on the website

http://www.atmop.eu

The following data sets will be assimilated in DTM2013:

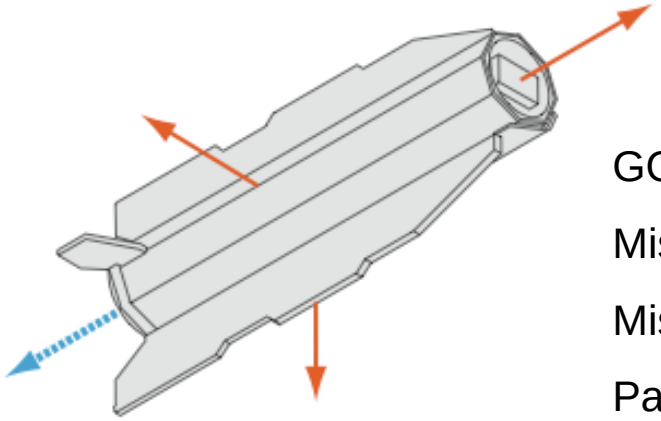
- ✓ CHAMP 2001-2010
- ✓ GRACE 2003-2012
- ✓ GOCE (November 2009 – May 2012)
- ✓ Starlette & Stella 1994-2012
- ✓ Deimos-1 3/2010-9/2011
- ✓ CACTUS 7/1975-1/1979
- ✓ DE-2 (T, He, O, N2) 8/1981-2/1983
- ✓ AE-C (N2) 1/1974-4/1977
- ✓ AE-E (T, He, O) 12/1975-5/1981
- ✓ SUSIM O_2 (October 1991 – February 2005; sparse data!)

ESA/STSE contract: GOCE density and winds

Proposal in response to

ESA AO/1-6367/10/NL/AF

"GOCE+ Theme 3: Air density and wind retrieval using GOCE data"



TU Delft, The Netherlands
CNES, France
HTG, Germany

Information on the project and the products:

http://thermosphere.tudelft.nl/goceplustheme3/

GOCE Launch:	17 march 2009 from Plesetsk
Mission objectives:	High-resolution gravity field of the Earth
Mission orbit:	Sun-synchronous, dawn/dusk, at 270 km
Payload:	Gradiometer (accelerometers), GPS
Drag control:	Ion thrusters commanded in closed-loop

GOCE data from November 2009 through May 2012 have been processed, and the inferred densities and winds are validated.

- The density and wind products will be made available this summer via ESA/ESRIN
- The products will be presented at the ESA Living Planet symposium in Edinburgh in September.

- **GOCE end-of-life estimate is mid-October 2013;**
- **Mission altitude was lowered to 240 km (30 km lower than nominal mission altitude) from August 2012 – May 2013;**