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# Assessment of the Semi-Empirical Drag Temperature Model (DTM) in the Framework of the FP7 Project ATMOP

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Atmospheric density models are used in satellite orbit determination and prediction programs to compute the atmospheric drag force, as well as in upper atmosphere studies. They represent temperature and (partial) density as a function of altitude, latitude, local solar time, day-of-year, and parameters related to the state of atmospheric heating due to solar EUV emissions and solar wind.

The new DTM model will assimilate the full CHAMP high-resolution density data set, as well as the GRACE density data up to at least the same date (September 2010). GOCE density data, at 255 km altitude, will be assimilated as soon as they will be available. For the altitude range 120-200 km, i.e. for which data are sparse, we will try to constrain the model by means of pseudo-data coming from the first-principles model CMAT2. The solar and geomagnetic activity indices F10.7 and Am will equally be replaced by (most likely) S10.7 and a new 15-minute geomagnetic index currently under development within ATMOP.

This presentation will give an overview of empirical density model performance, including the most recent unpublished DTM model, DTM2009, by comparing to density data in the 200-1000 km range and covering low-to-high solar activity. Density data from CHAMP, GRACE, GOCE, TLEs, Deimos-1 and geodetic satellites are used in the evaluation. The results will serve as a benchmark for the ATMOP models under development.