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# Effects of the Earth Albedo and Thermic Emissivity on Geodetic Satellite Trajectories: a Mean Model from 2000-2016 data sets.

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Part of the energy received on the Earth from the Sun is split into two components, a short wave component which corresponds to the visible emissivity of the Earth's surface (albedo), and the long wave part corresponding to the thermic emissivity (infrared wavelengths). These two components induce small non gravitational forces on the orbits of artificial satellites, towards the radial direction (mainly), that we are evaluating to derive a mean model.

The first step to evaluate the mean amplitudes and periods of the generaetd perturbations consists in comparing post-fit adjustment of geodetic satellites to SLR data, in two dynamical models accounting or not accounting for empirical forces standing for such effects: the orbits of the geodetic satellite STARLETTE, Stella, Ajisai, Lageos 1 and Lageos 2 are carried out in such a way over the period 2000-2016, with the GINS GRGS orbit computation s/w.
We then use three kinds of data sets to investigate the mean amplitudes of the perturbations, and to investigate features on regional spatial scales: (i) Stephens tables, (Stephens, 1980), ECMWF (European Centre for Medium-Range Weather Forecasts ) data sets (that are available at GRGS, Groupe de Recherche de Géodésie Spatiale, France), and CERES (Clouds and the Earth's Radiant Energy System) data sets (publicly available).We analyze what is the data set leading to the lowest residual level. Then, following an approach close to the one developed by Stephens, we propose a set of monthly grids that are averaged over the period 2000-2016, and that is evaluated through the orbit computation of the above-mentioned satellites.