A SERVICE OF POSITION & PHYSICAL EPHEMERIDES COMPUTATION DEDICATED TO THE SMALL BODIES OF THE SOLAR SYSTEM. J. Berthier[1], D. Hestroffer[1], B. Carry[2], J. Durech[3], P. Tanga[4], M. Delbò[4] and F. Vachier[1], [1]IMCCE-CNRS-Paris Observatory (Av. Denfert-Rochereau, F-75014 PARIS, France, berthier@imcce.fr; hestro@imcce.fr), [2]ESO, Santiago office (Alonso de Cordova, 3107, Viatacura, Casilla 19001, Santiago, Chile, bcarry@eso.org), [3]Astronomical Institute-Charles University (V. Holesovickach 2, CZ-18000 Prague, Czech Republic), [4]Cassiopée-Observatoire de la Côte d'Azur (Le Mont Gros, BP 4229, F-06304 NICE, France).

Introduction: Ephemerides of solar system bodies are most needed in many applications. They are useful to the astronomer to prepare his observations proposal, for accurate thermal modeling, or in analyzing observational data, also for predicting instruments performances of moving and extended objects, etc. Since the pioneering work of Russel [1] it is well known that light-curve of asteroids encompass information on their shape, making them more than only point-like source. And since then, space-probes during their fly-by to asteroids revealed all complex aspects of their macroscopic scale and surface features.

SSODNet: We have developed at the IMCCE a service, named Solar System Object Database NETwork [2], that offers many possibilities, among which:

- a name resolver for small bodies of the solar system (and planetary bodies);

- a data node with a search engine that offers easy inter-connection of various worldwide database (MBOS, SMASS, LAOSA, asteroid models, etc.) as well locally host in the framework of the VO Paris Data Centre;

- a computing node for generating position ephemerides as well as ephemerides for the physical observations. This node is similar to the famous JPL Horizons [3], but with some fundamental technical aspects allowing different use though generic web-service and Virtual Observatory protocol.

Physical ephemerides: The service offers in particular some original features for the computation of asteroids physical ephemerides taking into account their spin and shape models made available from e.g. lightcurve inversion and/or high resolution imaging from optical telescopes, and radar observations. Also different visualizations and data-format outputs are available for uploading and directly through a web-service. For instance one can generate a fits file showing the orientation, brightness distribution, size, etc (Fig. 1), that can be used for further convolution with an instrument PSF or transfer function (Fig. 2) as well as the Aladin system based at CDS. To these one can also add an radial velocity map. In future developments we will include albedo and thermal maps, and comets models. A synthetic database for general studies of the Gaia mission is also in construction.

References: [1] Russell (1906) *ApJ*. 24, 18. [2] SSODNet, http://ssodnet.imcce.fr/, [3] Chamberlain et al. (1997) DPS 29, #2106, http://ssd.jpl.nasa.gov/?horizons.

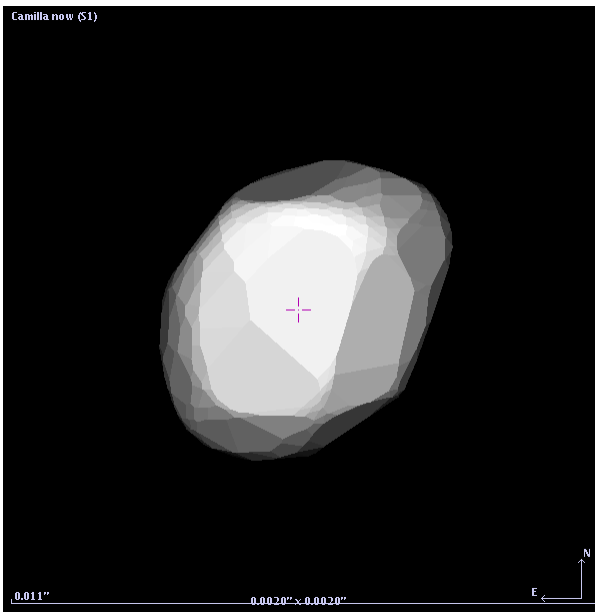

Fig. 1: Example of a FITS image generated by the service, showing the orientation, brightness distribution and size of (107) Camilla.

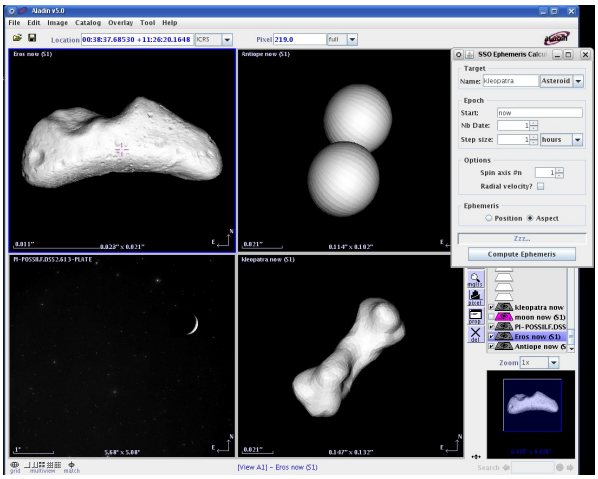

Fig. 2: Solar System Object calculator implemented in Aladin software.