

THE IMPACTON PROJECT: A NEW FACILITY FOR NEOS STUDIES IN BRAZIL. D. Lazzaro¹, T. Rodrigues¹, J.M. Carvano¹, F. Roig¹, T. Mothé-Diniz² and the IMPACTON team, ¹Observatório Nacional, Rua Gal. José Cristino 77, 20921-400 Rio de Janeiro, Brazil, ²UFRJ/Observatório do Valongo, Lad. Pedro Antônio 43, 20080-090 Rio de Janeiro, Brazil.

Introduction: The IMPACTON project, which in Portuguese stands for “Enterprise of the National Observatory to Monitor and Study Asteroids in the Neighborhood of the Earth”, started back in 2005, with the purpose to install and operate a NEO studies dedicated telescope in Brazil. Remote operations are expected to start in the near future, but since March 2011 several classical observational runs have been performed. In the framework of these test, several asteroids have been observed, in particular the Earth close approach of asteroid 2011 GP59. In the present paper we will describe the installation and technical specification of the new facility – OASI – and some preliminary results.

The IMPACTON project: The main scientific goal of the project is to characterize the physical properties, in particular orbit, spin, shape and colors, of the largest possible number of NEOs discovered by other search projects [1]. In order to constrain their orbit and, simultaneously, obtain a homogeneous data set of their basic physical properties, photometric observations will be carried on in a routinely way.

To achieve the above aims, a 1-m aperture telescope has been installed in a remote and desert site in the Northeastern part of Brazil. The coordinates of the new facility, called the Observatório Astronômico do Sertão de Itaparica – OASI – are: 08°47′32.1” S and 38°41′18.7”W.

The telescope, built by Astrooptik (Germany) has an alt-azimuth mounting, with a f/3 primary focal ratio and a f/8 focal ratio. It is equipped with a back-illuminated Apogee Instruments CCD of 1024 x 1024 pixels, with a 13 x 13 micron size. With these specification a sky field of about 6' x 6' is covered, with a focal plane scale of 0.343 "/pixel.

First results: Since March 2011 diverse observational runs have been performed at the OASI. Most of these runs have been dedicated to define the optimal operation and reduction strategy.

In the framework of these tests, the Earth close approach of asteroid 2011 GP59 was observed during April 14th. This very fast-moving and fast-rotating asteroid was a very challenging test for the IMPACTON project. Discovered on April 9, 2011, this asteroid reached a nominal distance to Earth of 0.0036 AU on April 15th, 2011, with a relative velocity at close-approach of 8.05 km/s. The asteroid was followed during nearly two hours, obtaining a quite

densely spaced lightcurve. The IMPACTON reduction pipeline was used to obtain V- and R- magnitudes and the preliminary analysis confirms a rotational period of 0.122hr, as given in the literature, with indication of, possibly, a second long period modulation, as shown in Fig. 1. Lightcurves were obtained in the V- and R- filter.

Other asteroids were observed during the test period giving promising results that will be discussed.

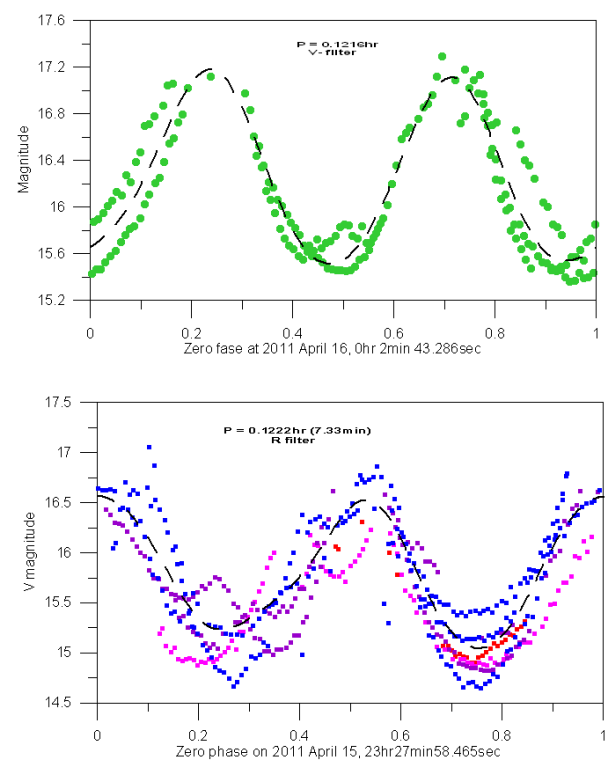


Figure 1: Phase curve of asteroid 2011 GP59

References:

- [1] Lazzaro D. (2010) BAAA, 53, 315-324.

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