

VISIBLE SPECTROSCOPY OF NEAs IN THE FRAMEWORK OF THE ESA-SSA P3NEOI PROGRAM.

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Introduction: The Solar System group of the Instituto de Astrofísica de Canarias (IAC) is member of a consortium of astronomical observatories led by Deimos Space S.L.U, that presented a proposal to the ESA ITT no. AO/1-9591/18/D/MR “P3-NEO-I - Observational support from collaborating observatories”. The objective of this project is to provide ESA with the support of several observatories contributing to the follow-up of relevant objects for orbit computation and physical characterization.

We lead the Spectroscopic Observations Work Package (WP) that aim to substantially increase the sample of near-Earth Objects (NEOs) with known spectral properties. This is crucial for understanding the origin and the evolution of NEOs and their potential threat.

In this work we will present the preliminary results of this spectroscopic program

Aims of the program: the main objective of the WP is to obtain a significant number of visible or near-infrared spectra of NEOs in order to increase the current number of objects with spectra available in any of these wavelengths; to obtain complementary visible/near-infrared spectra of NEOs with part of the spectrum already observed. This will enhance significantly the European contribution to the NEO research. We will be able to determine the composition of a large number of these objects, which represents a great opportunity to answer fundamental questions about their origin, properties, evolution and future potential threat.

The observations: Spectroscopic observations using 2m-class or larger telescopes in the “El Roque de los Muchachos” Observatory (ORM, La Palma, Spain) started late April 2019. Data have been obtained in different runs almost every month. We used the 2.5m Nordic Optical Telescope (NOT), the 2.5m Isaac Newton Telescope (INT), the 3.6m Telescopio Nazionale Galileo (TNG), and world’s largest optical telescope, the 10.4m GranTeCan (GTC).

Data with the 2.5m NOT was obtained on 8 different nights (Apr. 24, May 5, June 6, July 18, July 19, Oct. 18, Dec. 2, 2019, and Jan. 11, 2020). A total of 26 spectra of 25 different objects were obtained and reduced (Fig. 1).

Additional data was obtained during one observing run (2019-10-01) with the 3.56m TNG (2 asteroids), two observing runs with 2.5m INT (3 objects) and one observing run with the 10.4m GTC (5 objects).

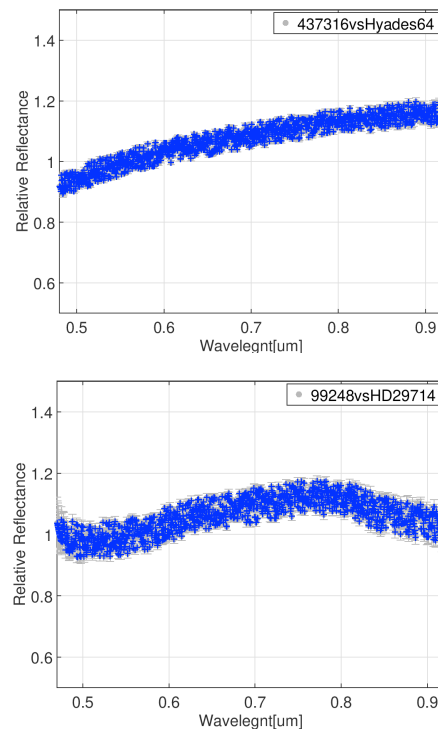


Fig. 1 – Example of visible spectra of two of the NEAs (437316 and 99248) observed with AL-FOSC spectrograph attached to the 2.5m NOT on Jan. 11, 2020.

Database and analysis: We will make this database available at the Small Bodies Node of the NASA Planetary Data System (PDS) in the near future. This will include the spectral classification using Bus or Bus-DeMeo taxonomic system [1].

References: [1] DeMeo, Icarus, 202, 1, p.160-180 (07/2009).