

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

J. Licandro^{1,2}, M. Popescu³, A. Oscoz^{1,2}, J. de León^{1,2}, O. Zamora^{1,2}, and M. Monelli^{1,2}, ¹Instituto de Astrofísica de Canarias, C/Vía Láctea s/n, E-38205 La Laguna, Tenerife, Spain (jlicandr@iac.es, aoscoz@iac.es, jmlc@iac.es, ozamora@iac.es, monelli@iac.es) ²Departamento de Astrofísica, Universidad de La Laguna, E-38206 La Laguna, Tenerife, Spain, ³Astronomical Institute of the Romanian Academy, 5 Cuțitul de Argint, 040557 Bucharest, Romania (mpopescu@aira.astro.ro)

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 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 that already have near-infrared/visible spectral information available; and to enhance the European contribution to the NEO research, in particular to the composition of NEOs, which represents a great opportunity to answer fundamental questions about their origin, properties, evolution and future potential threat.

Additionally, we observe objects of interest of the Near-Earth Object Human Space Flight Accessible Targets Study (NHATS) and the Arecibo Planetary Radar Science Group.

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 3.5 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).

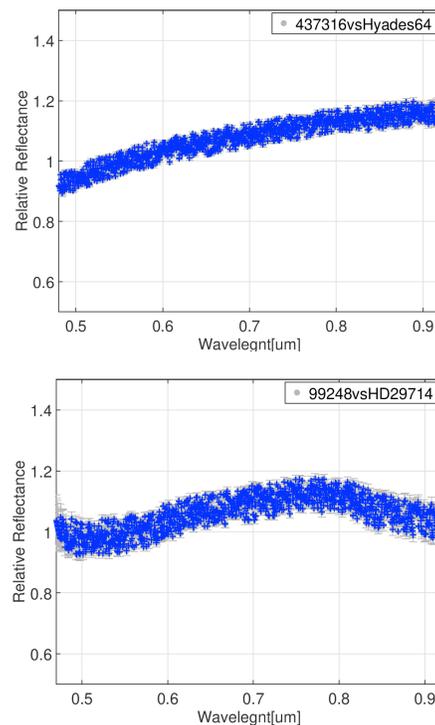


Fig. 1 – Example of visible spectra of two of the NEAs (437316 and 99248) observed with ALFOSC spectrograph attached to the 2.5m NOT on Jan. 11, 2020.

Data base 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 obtained using the procedures of the M4AST tool (<http://m4ast.imcce.fr/index.php/index/analyze>) described in detail by [1].

References: [1] Popescu, M., Birlan, M., & Nedelcu, D. A. 2012, A&A, 544, A130