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THE ITALIAN CONTRIBUTION TO THE NEOSHIELD-2 EU PROJECT: RESULTS OF THE FIRST YEAR OF ACTIVITY

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ABSTRACT

The physical characterization of the Near Earth Object (NEO) population is essential to define successful mitigation strategies in case of possible impactors. Unfortunately, more than 85% of the 15,500 known NEOs still lacks a compositional characterization, and their increasing discovery rate (currently 1,500 objects/year) makes the situation progressively worse.

The NEOShield-2 project (2015-2017) has been approved and financed by the European Commission in the framework of the Horizon 2020 program with the aims i) to study detailed technologies and instruments to conduct close approach missions to NEOs or to undertake mitigation demonstration, and ii) to retrieve physical properties of a wide number of NEOs, in order to design impact mitigation missions and assess the consequences of an impact on Earth.
In particular, the Italian team is responsible of the Task 10.2.1 **'Colours and Phase function**', with the aim of acquire photometric measurements in order:

I. to perform a preliminary taxonomic classification using computed color indexes and have the first constraints on the surface composition and albedo of the observed objects;
II. to study the phase function, and to derive their parameters to better compute the absolute magnitude.

We will present a preliminary analysis of the observations performed by the Italian counterpart inside the NEOShield-2 project, with a particular attention to the physical characterization of NEOs performed at Telescopio Nazionale Galileo (TNG) and the phase curve analysis obtained with the Observatório Astronômico do Sertão de Itaparica (OASI).
In the selection of the targets particular attention has been devoted to objects with no physical characterization and with an absolute magnitude H > 20, which roughly corresponds, assuming a mean albedo of 0.15, to objects below 300 m in size. Preliminary results show that among our final sample of **105 NEOs characterized for the first time,** carbonaceous asteroids seem to be relatively abundant, although siliceous asteroids still represent the majority of the whole sample. Recent photometric studies suggested that the fraction of S-complex asteroids, that once were the dominant component of the NEO population, could be lower than expected, and the high rate of silicates NEOs observed could be due to a selection effect. Furthermore, some of the C and X-complex objects in our sample show a high inclination and a very low Minimum Orbital Intersection Distance (MOID) with our planet, representing at the moment the most dangerous objects in our present set of bodies.

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