



TNOs are Cool: A Survey of the Transneptunian Region - Physical Characterization of 14 Plutinos using PACS observations

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Since the discovery of the first Transneptunian Objects (TNOs), a number of different dynamical classes of this primordial population have been identified. One of these classes, the Plutinos, is named after its most prominent member and populates the 2:3 resonance of Neptune. Despite the fact that some of the orbits of Plutinos are highly eccentric and can even overlap with that of Neptune, they represent the most densely populated, stable and therefore oldest population among resonant TNOs [Melita & Brunini 2000]. Their origin was first explained by [Malhotra 1995], showing that a radial outward movement of Neptune led to resonance capture. Escaping Plutinos can populate the Centaur region and even be a source of Jupiter Family Comets [di Sisto et al. 2010].

We present the physical characterization of 14 Plutinos and 1 Plutino candidate using PACS observations as part of the Herschel Open Time Key Programme 'TNOs are Cool' [Müller et al. 2009]. This project was awarded some 370 h of Herschel observing time for the investigation of about 140 TNOs with known orbits. The goal is to characterize individual objects and the full sample using radiometric techniques in order to probe formation and evolution processes in the Solar System and to establish a benchmark for understanding the Solar System debris disk as well as extra-solar ones.

The Plutino sample was selected solely on the basis of its Herschel observability and covers a wide range of dynamical properties in the Plutino population; it therefore serves as a probe for the whole population.

Thermal-infrared data were taken using the PACS instrument in scan-map mode [Mueller et al. 2010]. In order to derive estimates of diameter and albedo, an asteroid thermal model was applied. Uncertainties in both parameters were estimated using a detailed Monte-Carlo analysis. A more sophisticated thermophysical model was applied to check the results and probe realistic ranges of thermal inertia. We discuss our results and compare them to already published results of Plutinos and other TNO subpopulations.

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[Müller et al. 2010]: Müller, T. G. and the 'TNOs are Cool'-Team 2010, A&A, 518, L146

[di Sisto et al. 2010]: di Sisto, R. P., Brunini, A. & de Elia, G. C. 2010, A&A, 519, A112+