

Photometry and radiometric modeling of Transneptunian objects in support of the Herschel key program 'TNOs are Cool'

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Abstract

We aim to analyze the measurements from VRI observation of 6 Transneptunian objects (TNOs) using Calar Alto 3.5 m telescope and the MOSCA instrument. The targets are collected from the target list of the Open Time Key Program 'TNOs are Cool' at the Herschel Space Observatory [1, 2]. It is noted that there is a series of publications based on the observations from this program (see [3]).

The TNO population are considered as the primitive remnants of the planetesimal disc and should compose of unmodified material from the origin of Solar system. The physical properties of TNOs allow us to better constrain the formation and evolution models of the outer solar system. For instance, a color-albedo diagram for a sample of 109 TNOs analyzed by [4] has revealed a separation into two clusters of objects, giving evidence for a compositional discontinuity in the early solar system.

The 'TNOs are Cool' program was performed to determine the physical properties including size, albedo, and thermal properties for 130 TNOs and Centaurs. To analyze the Herschel measurement and put the results in the perspective, the complementary photometric information is needed [5].

The aim of imaging data observed through Calar Alto 3.5 telescope is to provide missing photometry information for Herschel targets. The TNO targets that were observed during 10 nights in 2014 are: 2002KW14, 2003VS2, 2003WU172, 2004XA192, 2005UJ438, 2008FC76.

The main purpose of this work is to obtain accurate multicolor magnitudes of the objects for use in the radiometric modeling together with the Herschel results in order to determine the size and albedo of the objects. Moreover, the colors of the objects are compared with the taxonomic information available on the respective dynamical population.

References

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