



First unambiguous detection of very small bodies in the outer solar system beyond 150 UA

A. Doressoundiram (1), F. Roques (1), V. Dhillon (2) and T. Marsh (3)

(1) LESIA, Observatoire de Paris-Meudon, France, (2) University of Sheffield, UK, (3) University of Warwick, UK (alain.doressoundiram@obspm.fr)

Observations have been performed in April 2004 with the 4-m William Herschel Telescope in Canarias with the ultra-fast, triple beam camera Ultracam. The aim of these observations was to detect small Trans-Neptunian Objects (TNOs), which are beyond the reach of imaging surveys, by the method of “serendipitous” stellar occultation. Serendipity occultation means here that we observe well chosen stars and we count occultation of the stars by passing TNOs

The flux of two stars has been recorded with a time frequency of 40 Hz in three wavelengths, 0.36 0.48 and 0.77 microns. Then, the occultation is a diffracting phenomenon whose spectral signature can be tested and modelled.

We report here the first and unambiguous detection of hectometre-size TNOs at a few tenth to hundredth of AU. This result brings strong constraints on the low end of the size distribution of the trans-Neptunian objects, 100 meters to 1 km. With such detections we statistically explore the size distribution of TNOs and the expected turnover radius due to collisional erosion of the small objects. This places constraints on the origin of comets and on the formation of outer planets of the solar system.