



Imaging the invisible solar system: inverse problems of asteroid photometry

M. Kaasalainen

Department of Mathematics and Statistics, PO Box 68, FI-00014 University of Helsinki, Finland (mikko.kaasalainen@helsinki.fi)

The physical properties of asteroids are mostly obtained with photometry. The resulting full models describe the shapes, spin states, scattering properties and surface structure of the targets, and are the solutions of mathematical inverse problems. I review what can and cannot be obtained from photometric (and complementary) data, and how this is done in practice. The role of photometry will become completely dominating with the advent of large-scale surveys capable of producing calibrated brightness data. In this way, tens of thousands of asteroids can be modelled, amounting to a comprehensive mapping of the various asteroid populations.