Geophysical Research Abstracts
Vol. 14, EGU2012-10016, 2012
EGU General Assembly 2012

A new 3D reconstruction technique applied to small solar system bodies

C. Capanna (1), L. Jorda (1), G. Gesquière (2), and P. Lamy (1)

(1) Laboratoire d'Astrophysique de Marseille, Marseille cedex 13, France , (2) Laboratoire des Sciences de l'Information et Systèmes, Arles cedex, France

The reconstruction of an accurate global 3D shape of small solar system bodies (asteroids and cometary nuclei) from visible images is a problem which has been solved in the past using stereo-photogrammetry or more recently stereo-photoclinometry. We present here a new method called "photoclinometry by deformation". The method applies deformation to a three-dimensional triangular mesh which represents the surface of the body until it minimizes the difference between observed and synthetic images viewed under different geometric conditions. The method allows to retrieve both a low-resolution global shape of the object and high-resolution local digital terrain models. The method has been applied to images of the two asteroids 2867 Steins and 21 Lutetia observed by the OSIRIS imaging system aboard the ROSETTA spacecraft.