Geophysical Research Abstracts
Vol. 14, EGU2012-9633, 2012
EGU General Assembly 2012

FANTINA: Fathom Asteroids Now: Tomography and Imagery of a NEA-Payload For Marco Polo R CV3 / ESA mission

A. Herique (1), J Biele (2), P Bousquet (3), V Ciarletti (4), TM Ho (5), JL Issler (3), W Kofman (1), P Michel (6), D Plettemeier (7), P Puget (1), JC Souyris (3), S Ulamec (2), T van Zoest (5), and S Zine (1)

(1) UJF, IPAG, Grenoble, France (alain.herique@obs.ujf-grenoble.fr), (2) DLR , Cologne, Germany, (3) CNES ,Toulouse, France, (4) LATMOS, Guyancourt, France, (5) DLR, Bremen,, Gremany , (6) OCA, Nice, france, (7) TUD, Dreden, Germany

The internal structure of small bodies is still poorly known and has never been measured directly. There is no way to determine from ground based observation whether the body is a monolithic piece of rock or a rubble-pile, an aggregate of boulders held together by gravity and how much porosity it contains, both in the form of micro-scale or macro-scale porosity. Knowing this structure is a key point for a better understanding of the asteroid accretion and dynamical evolution. It is the main objective of the FANTINA experience proposed Payload for Marco Polo R CV3 / ESA mission: FANTINA (Marco Polo's Daughter) for Fathom Asteroids Now: Tomography and Imagery of a NEA is to provide measurement capabilities and science data which are not accessible by remote sensing of the asteroid from the Marco-Polo R spacecraft alone and which complement the analysis of the returned samples.

The FANTINA payload is a Lander carrying the ASSERT experiment and a complementary payload to be defined: ASSERT is a bistatic CONSERT/Rosetta-like radar to achieve the tomography both in transmission and in reflexion of the asteroid in order to characterise its composition and its heterogeneity from decimetric to global scale. The lander is a long-lived bus in the 10-kg class derived from MASCOT/Hayabusa 2.

This paper reviews the science rationale of FANTINA in the context of the Marco Polo R mission to 1996FG3. The surface package concept will be reviewed including the radar tomography principles. So a preliminary design and budget will be done.