



## **Consert for Asteroid - radar tomography of Near Earth Asteroid**

Alain Herique (1), Dirk Plettemeier (2), Wlodek Kofman (1), Stephan Ulamec (3), Jens Biele (3), Jean Pierre Goutail (4), Pierre Beck (1), Jeremie Lassue (5), Antonella Barucci (6), and Patrick Michel (7)

(1) CNRS - LPG, Grenoble, France (alain.herique@obs.ujf-grenoble.fr), (2) Technische Universitaet Dresden, Germany, (3) MUSC - DLR, Cologne, Germany, (4) LATMOS - IPSL - UVSQ, France, (5) LPI, Houston, USA, (6) LESIA, Meudon France,, (7) Observatoire de la Côte d'Azur, Nice, France

Consert for Asteroid is a radar to instrument the Mascot lander, which is proposed in the frame of future Near Earth Asteroid missions. This low frequency radar is a unique opportunity to sound the internal structure of the target. Its objective is to achieve the tomography both in transmission and in reflexion of the asteroid in order to determine its fracturing, its stratigraphy and its heterogeneity at different scales, for a better understanding of accretion and evolution phenomena.

This talk reviews all the aspects of the proposed experiment. The problematics of the NEA is reviewed in order to demonstrate the interest of low frequency radar sounding. A consert-like bistatic experiment solution is proposed to fulfil the low mass budget constraints. The concept of this tomography between the lander and the orbiter is detailed, including its different operation modes, the measurements, the inversions and the addressed NEA issues.

In the second part, we present the preliminary design of our instrument. This review starts from the existing Consert instrument on board the Rosetta and Philae probes. The main instrument trade offs are presented from the mission characteristics and the proposed target. The electronics are revisited and the budgets are updated. So some antenna designs are proposed for both lander and orbiter spacecrafts. Finally, a preliminary experiment budget is shown.