Status on action 5.11 – NEOtoolkit, TOOLBOX FOR A CHARACTERISATION PAYLOAD

Pierre W. Bousquet

Centre Spatial de Toulouse, October 11th

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Aim of action 5.11

To reach a consensus among SMPAG members regarding the objectives of a space mission designed for a NEO characterization, and then the instruments that can be made available for achieving it. This consensual definition of a 'straw man payload' would be available on a reasonably short notice for a characterization mission targeted to NEOs that present a potential threat.

Planned sequence :

- **Summarize the outcomes of a study dedicated to Apophis (done)**
- **Identify some short notice mission scenarios and specify the objectives of the associated characterization mission**
- **Specify the instruments and mission requirements for achieving these objectives**
- **Review available existing instruments and, in case of gaps, assess the need for the development of new instruments**
- **Provide with cost estimates of such instruments, if available**

Documentation in support to action 5.11

- Synthesis of CNES Apophis study,
- FP7 project Neoshield – 1 deliverable 2.2, Requirements for mitigation precursor reconnaissance,
- FP7 project Neoshield – 1 deliverable 2.3, Instrumentation design for mitigation precursor & demo mission,
- “Science case for the Asteroid Impact Mission (AIM): A component of the Asteroid Impact & Deflection Assessment (AIDA) mission”, published in Advances in Space research (paper based on the initial AIM configuration),
- “HERA mission to the binary asteroid Didymos characterization and interpretation of the impact of the DART mission”, under revision, submited to Advances in Space research,
- Payload and Instrumentation Design for an Orbit Knowledge Improvement via Flyby Missions at Asteroids, Stephan Schuster - TUM term thesis
- Asteroid Orbit Knowledge Improvements via Spacecraft Flybys, Philipp Kollo – TUM term thesis

Potential mission scenario

- 1 - Minimum characterization through a cubesat performing a single fly-by of the NEO target (such as the Intrepid mission concept presented by JPL at the last LCPM).

- 2 - Basic characterization through a conventional probe (200 – 500 kg class) performing a single fly-by of the NEO target .

- 3 - Enhanced remote sensing through an orbiter achieving RV with the NEO target .

- 4 - Enhanced remote sensing through an orbiter achieving RV with the NEO target + inside structure characterization enabled by one or several landers .

Action 5.11 participants

Lead : CNES

Support from Belgium, UKSA, ESA

Expected attendance to 12th october meeting :

- **Pierre Bousquet**
- **Ian Carnelli**
- **Detlef Koschny**
- **Patrick Michel**
- **Ozgur Karatekin**
- **Pascal Rosenblatt**
- **… ?**