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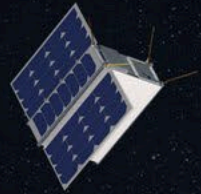
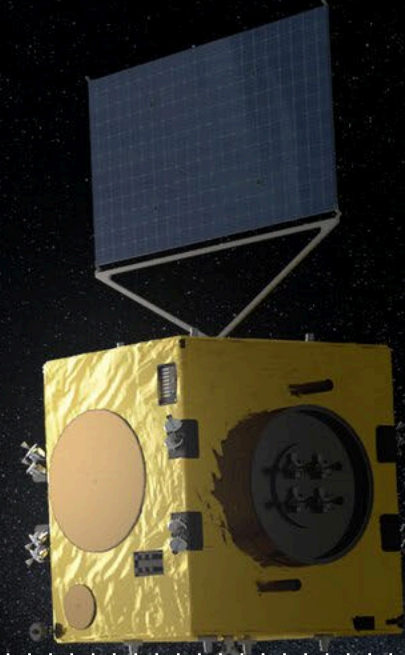


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SMPAG ASI Delegation - Tasks

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ASI delegation

Space Mission Planning Advisory Group, 09/02/2022

Introduction

Space Mission Planning Advisory Group (SMPAG)

Prepare a coordinated response protocol to an impact threat scenario

- Criteria and thresholds for impact response actions
- Mitigation mission types/technologies to be considered
- Mapping of threat scenarios to mission types
- Reference missions for different NEO threat scenarios
- A plan for action in case of a credible threat
- Communication guidelines in case of a credible threat
- Roadmap for future work on planetary defence
- Criteria for deflection targeting
- Toolbox for a characterisation payload



Kinetic impact missions

- Kinetic impactor mission design
 - Parametric study for kinetic impact missions
 - Target asteroid selection
 - Definition of 2 possible cases of threat scenarios: direct hit and resonant scenario
 - Mission design for kinetic impactor direct hit
- Kinetic impactor effect analysis
 - Improving direct hit scenarios with multiple fly-bys
 - Resonant hit scenarios
 - Impact cratering physics modelling and momentum enhancement factor estimation
- Multiple kinetic impactor mission design
 - Considering uncertainty of deflection action and fragmentation effects

Summary

Gravity tug missions

- Gravity tug system design
- Design of electromagnetic tug mission

Summary

Proximity operation and modelling

- Model for resonant encounters for robust deflection
- Optical autonomous guidance navigation and control during asteroid deflection technique
- Recovery of the gravity field through relative navigation between two s/c
- Study of dust evolution at asteroid vicinity
- Report to be written by Oct 2022



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