

The role of Small Satellites in Asteroid studies and Planetary Defence missions: the Hera Milani and Ramses CubeSat 1

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Abstract

In the frame of the last 20 years, the scientific community and space Agencies focused attention and addressed efforts on the asteroid analysis domain, in support of the Planetary Defence roadmap definition and implementation. The role of industry is crucial to develop and implement ground and space systems that can support the activities defined by such institutions and Government, and the collaboration between countries is necessary to fulfill such challenging objectives.

Tyvak International, a European Company leader in the small satellites' development, launch and operations, plays an important role in the European planetary defence domain, being part of the first ESA's planetary defence missions: Hera and RAMSES.

Hera was launched in 2024 to characterize the Didymos asteroid after NASA's DART impact and currently on its way to the asteroid, while RAMSES, is the ESA mission to the Apophis asteroid, in the frame of the close encounter of April 2029. Both missions include two CubeSat's each. Tyvak International is Prime Contractor of the development of the Hera Milani CubeSat, leading an European consortium of 10+ entities, and thanks to the experience gained through this mission and related heritage, was selected by ESA for the development of one of the RAMSES CubeSat.

Hera Milani will use a hyperspectral imager, an RGB camera and a dust analyser, to characterize the Didymos asteroid system; RAMSES CubeSat will implement the Milani platform to accommodate a Low Frequency Radar, to analyse the internal structure of the Apophis asteroid.

