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Surface gravimetry on Dimorphos

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In the frame work of HERA mission, the gravimeter for small solar system objects (GRASS) has been developed to measure the local acceleration vector on the surface of the moonlet of the binary asteroid, Dimorphos. GRASS will be onboard Juventas CubeSat which is one of the two daughtercraft of ESA's Hera spacecraft. Launched in 2024 it will arrive in the binary system in 2026. Following the soft-landing of the Juventas CubeSat, GRASS will record the temporal variation of the surface gravity vector.

The average gravitational force expected on the Dimorphos surface is around $5 \times 10^{-5} \text{ m s}^{-2}$ (or 5 mGal). Apart from the self-gravitation of the body, centrifugal forces and the acceleration due to the main body of the system contribute to the surface acceleration. The temporal variations of local gravity vector at the landing site will be used to constrain the geological substructure (mass anomalies, local depth and lateral variations of regolith) as well as the surface geophysical environment (tides, dynamic sloped and centrifugal forces).

We will present the GRASS science objectives in the Hera mission the operational concept that is foreseen to reach these objectives, its current status of development including first test results and the by simulation estimated performances of the instrument.