

# DISC - the dust impact sensor and counter on-board Comet Interceptor Mission: performances evaluation and impact tests.

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The Comet Interceptor space mission, selected by ESA in June 2019 as the first F-Class mission, will study a dynamically new comet or an interstellar object by a unique multi-point 'measurement. The Dust Impact Sensor and Counter (DISC), devoted to the dust coma characterization, is part of the payload selected for C I. It will be mounted on-board two of the three spacecraft, as part of the Dust-Fields-Plasma (DFP) suite, dedicated to study: 1) dust in the coma; 2) magnetic field; 3) plasma and energetic neutral atoms. DISC architecture originates from the Impact Sensor subsystems, part of the Grain Impact Analyzer and Dust Accumulator (GIADA) that successfully flew on-board the ESA/Rosetta spacecraft.

DISC main scientific objectives are: 1) to define the dust mass distribution for particles in the mass range 10<sup>-15</sup>-10<sup>-8</sup> kg ejected from the cometary nucleus; 2) to count dust particles with mass > 10<sup>-15</sup> kg; 3) to constrain dust particle density/structure.

DISC's sensing plate will be exposed to the cometary dust environment and subjected to Hyper-Velocity Impacts (HVI), due to the high fly-by speed (10 -70 km/s). To make a DISC performance evaluation and calibration we have devised an approach implying different techniques/methods: 1) HVI of real projectiles on the DISC breadboard at accelerator facilities, 2) HVI simulated employing a high-power laser on the DISC breadboard, 3) Numerical simulation of HVI on a simulated DISC sensing plate.

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## Face to face

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