



Velocity of dust impacting the IS (Impact Sensors) of GIADA, instrument on board Rosetta, evaluated by means of improved calibration curves.

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GIADA (Grain Impact Analyser and Dust Accumulator) on-board Rosetta measures the momentum of impacting cometary dust particle by means of the Impact Sensor (IS). The particle speed measurement is given by the time of flight between the GDS (Grain detection System), a laser curtain able to detect each dust grain entering GIADA, and the IS. These two measurements combined determine the mass of each detected grain. An extended calibration activity, performed on the GIADA Flight Spare Model (PFM), allowed us to obtain measurements, momenta and velocities, of a large number of single dust grains of different materials selected as cometary analogues for which a prior physical-chemical characterization was performed. Not all the grains entering GIADA are detected by the two detection systems, i.e. IS and GDS, thus not for all the detected grains it is possible to measure the speed. Nevertheless, we checked the possibility of deriving the speed of IS only detections. To this aim we characterized the response of the IS with respect to both the momentum and the kinetic energy of the cometary analogue grains shot into the GIADA PFM. We classified the responses considering: the density, the hardness and the fluffiness of the impacting cometary analogue particles. By means of these results we are able not only to determine the mass and speed of dust grains detected by the IS only, but also to evaluate their density, hardness and fluffiness.