# Characterization of 67P/Churyumov-Gerasimenko dust environment by GIADA

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The Grain Impact Analyser and Dust Accumulator (GIADA) is an instrument on-board the Rosetta/ESA spacecraft for in situ measurements of dust spatial distribution in the coma of 67P/Churyumov-Gerasimenko (67P hereafter). The main objectives of GIADA are characterization of spatial distribution, dynamical and physical properties of the cometary dust particles populating 67P coma with the final goal of studying the ejection process and the dust environment evolution. Integrating all information retrievable for individual dust particles from GIADA measurements , i.e. mass, speed, time and position, we studied the evolution of the dust environment. Between 15 September Sept. 2014 and 4 February Feb. 2015 Rosetta accomplished the circular orbits phase around the nucleus of comet 67P. GIADA monitored the coma dust environment for the entire period and a statistically relevant number ofthe detections allowed a detailed description of the particles, their spatial distribution and dynamical properties. GIADA distinguish different types of particles populating in the 67P coma: compact particles and fluffy porous aggregates. The detections of the first type of particles are concentrated at latitudes lat. and longitudes long. such that the spacecraft was in view of the 'neck' of 67P. In addition, we registered an increase of the compact particles from 3.36 to 2.43 AU heliocentric distances. The speed of these particles, with masses ranging from $1x10^{-10}$ to 3.9 x $10^{-7}$ kg, were found to vary from 0.3 to 12.2 m $s^{-1}$. The evolution of the particle mass and speed distribution , with respect to the distance from the nucleus constrains the dust acceleration region. The influence of solar radiation pressure on the fluxes of nanogram particles was studied comparing the dust flux collected towards the Sun direction with the one coming form the nucleus. These results confirm a strong anisotropy in the dust flux. The integrated flux of nanogram particles coming from the Sun direction is about 3 times larger than the flux coming directly from the comet nucleus.

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