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The size distribution of dust from comet 67P/Churyumov-Gerasimenko

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Abstract

The size distribution in a given ensemble of cometary dust grains reveals, e.g., which particles dominate the optical scattering cross-section when observed from a distance, and which particles carry the bulk of mass ejected into the interplanetary environment by the comet. The size distribution reflects the conditions under which the refractory material was stored in the comet and the processes releasing the dust from the surface. Potentially, it also preserves information on the material of which the comet has formed.

All instruments on board Rosetta have been sensitive to dust, and many have contributed to determining the size distribution, in situ or remotely [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12]. Different instruments were sensitive to different size ranges and measured different physical quantities from which the particle sizes were derived.

We will give a synopsis of published Rosetta measurements of the dust size distribution in comet 67P, identify comparable measurements, and check their compatibility. We will address systematic variations of the size distribution with season (comet true anomaly), region of origin of the dust, and spacecraft position. We will briefly discuss possible reasons if variations are found.

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