

Volatile grain morphology and statistics in the coma of comet 67P/Churyumov-Gerasimenko as seen by Rosetta ROSINA/COPS

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Rosetta was one of the cornerstone space missions of the European Space Agency which was the first to soft land and orbit a comet for over two years. The Rosetta Orbiter Spectrometer for Ion and Neutral Analysis (ROSINA) on board the Rosetta spacecraft measured the coma of the Jupiter-family comet 67P/Churyumov-Gerasimenko (hereafter 67P) in situ. ROSINA consisted of two mass spectrometers and the Comet Pressure Sensor (COPS).

COPS provided neutral gas density measurements in the cometary coma of 67P. COPS had two gauges, a nude gauge that measured the total neutral density and a ram gauge that measured the gas flux from the comet. With the combination of the two gauges, COPS was also capable of further deriving gas dynamic information such as the gas velocities.

COPS was operating most of the time during the scientific phase of the mission, measuring the neutral coma density in situ. In addition to the gas density data that showed the diurnal and seasonal variations of the comet, COPS data at times surprisingly showed some sharp peaks in the neutral density. These were interpreted as signals from the sublimation of the volatile content of cometary grains as they were heated up near or at COPS. We present some of our preliminary results on the morphology, properties, and distributions of these dust signals as seen by COPS.
