

Multi-instrument observations of the 67P outburst of 3 July 2016

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Abstract

On 3 July 2016, the signature of a small outburst on comet 67P was detected by several instruments on board ESA’s Rosetta spacecraft, at a heliocentric distance of 3.32 AU, outbound from perihelion. The event affected a 10 m-sized patch on the surface in the circular Basin F structure in the Imhotep region. We report on the nature of the surface change and on the properties of the ejected dust, found to consist of refractory grains of several hundred microns, and sub-micron-sized water ice particles. The activity was triggered at the local sunrise and continued over a time interval of 14 – 70 minutes. The high dust mass production rate is incompatible with the free sublimation of crystalline water ice as the only acceleration process. Additional energy stored near the surface must have increased the gas density. We suggest a pressurised sub-surface gas reservoir, or the crystallisation of amorphous water ice as possible alternatives.