

Spitzer Observations of Dust from 67P/Churyumov-Gerasimenko

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We present Spitzer/MIPS observations of the coma and dust trail of the Rosetta target comet 67P/Churyumov-Gerasimenko in November 2008, when the comet was at a heliocentric distance of 1.7 AU in-bound. Our observations covered the comet nucleus, coma, and sections of the dust trail, at 24 and 70 μm . We derive the colour temperature of dust in the coma, and a lower limit for the colour temperature of the trail dust, which was not detected at 70 μm . We discuss the implications of the 70 μm non-detection for the properties of the trail dust: either the elevated colour temperature may be due to grains large enough to support a temperature gradient across their surfaces, or the emissivity decreases with wavelength. Such an emissivity effect could be explained by the predominance of small ($< 100 \mu\text{m}$) grains in the dust trail that would have to be recently-produced by fragmentation of larger particles. From modelling of the trail at 24 μm , we constrain the dust size distribution, emission speeds, and production rates during the past apparition of the comet.