

The dust trail of comet 67P/Churyumov-Gerasimenko near aphelion

J. Agarwal (1), M. Müller (2), H. Bönhardt (3), W.T. Reach (4), M.V. Sykes (5), D.J. Lien (5), E. Grün (1,6)

(1) MPI for Nuclear Physics, (2) ESA/ESOC, (3) MPI for Solar System Research, (4) IPAC/SSC/Caltech, (5) Planetary Science Institute, (6) LASP

Images of the dust trail and neckline of Rosetta target comet 67P/Churyumov-Gerasimenko obtained with the Wide Field Imager at the ESO/MPG 2.2m-telescope on La Silla and with the MIPS instrument on board the Spitzer Space Telescope of NASA are presented. Since the observations were done far from perihelion (at heliocentric distances of 4.7 AU and beyond), we expect the observed dust grains to be larger than about 100 μm . Such particles carry the better part of the refractory mass released from the comet to interplanetary space, and they may constitute a hazard to the Rosetta spacecraft, scheduled to reach the comet in 2014. The images are compared to simulated ones obtained from a generalised Finson-Probststein model. The effect of varying the parameters of the dust emission is studied. Possible ranges for the size distribution, radiation pressure coefficient, and emission speeds of the large dust particles are derived that enable us to reproduce the observation.