



The dust coma of comet 81P/Wild 2 detected by Stardust

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Stardust successfully encountered comet 81P/Wild 2 on 2 January 2004 at a distance of 236 km. The on-board dust instruments detected almost 9000 impacts over a broad mass range of 10^{-14} to 10^{-6} kg, from which 2800 +/- 500 grains of diameter 15 microns or more are estimated to have impacted the aerogel collectors to be returned to Earth in January 2006. The dust distribution was highly non-uniform, with short duration bursts of impacts implying localised spatial density changes of orders of magnitude on scales of less than a km. Long exposure images of the comet reveal large numbers of jets projected nearly around the entire perimeter of the nucleus, many of which appear to be highly collimated with angular sizes of a few degrees. The overall mass distribution in the inner coma is dominated by the largest grains, with an average cumulative mass distribution index of $\alpha = 0.75 \pm 0.05$ (where the number of particles of mass m or larger, $N(m) \propto m^{-\alpha}$). However, almost 80% of the detected impacts occurred at a distance of ~ 4000 km from the nucleus where small grains dominated, with $\alpha = 1.13 \pm 0.2$.

We will present spatially resolved particle mass distributions throughout the coma which support the interpretation of the highly structured coma as due to jets and particle fragmentation.