AOGS 2006

Time and Spatial Distributions of Dust Ejected by Deep Impact Collision with Comet 9P/Tempel 1

T. KADONO[1], S. SUGITA[2], T. OOTSUBO[3], S. SAKO[2], T. MIYATA[2], H. KAWAKITA[4], R. FURUSHO[5], M. HONDA[6], J. WATANABE

[1] *JAMSTEC/IFREE*

[2] *University of Tokyo*

[3] *Nagoya University*

[4] *Kyoto Sangyo University*

[5] *Waseda University*

[6] *JAXA/ISAS*

[7] *National Astronomical Observatory of Japan*

The impactor from the Deep Impact spacecraft collided with the comet 9P/Temple1 at 2005/7/4 (UT). The large amount of cometary materials was ejected. We conducted mid-infrared (mid-IR) observations before and after its collision using COMICS (the Cooled Mid-IR Camera and Spectrometer), mounted on the Subaru Telescope [1]. One of the main observational results is the time and spatial evolution of the light flux of dust (Figs.2 and 4 of [1]). This indicates that the mass - velocity relation of ejected dust is not simply expressed by a single power-law. Assuming that light flux is proportional to dust mass, we find that a double structure can represent the observational results. This velocity structure needs some acceleration mechanisms other than the ejection caused by crater formation. One of the possible mechanisms is the expansion of H2O gas evaporated from the ejected dust. Actually, the observations from Deep Impact and Rosetta spacecrafts suggest that the evaporation of H2O occurred. We will discuss the plausibility of this acceleration mechanism, based on the observational data such as light flux and the two-dimensional distribution of silicate materials. References: [1] S. Sugita et al. (2005) Science, 310, 274-278.