P233-P001 **Room: Poster Session Hall** **Time: May 15**

Spatial and temporal distributions of ejecta in Deep Impact mission

Toshihiko Kadono[1]

[1] IFREE

The impactor launched 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 (Sugita et al. 2005).

One of the main observational results is the time and spatial evolution of the light flux of dust (Figs. 2 and 4 of Sugita et al. 2005). This indicates that the mass m - velocity v relation of ejected dust is not simply expressed by a single power-law. We assume a double structure. Assuming also that light flux is proportional to dust mass, it is found that the relations we propose can actually represent the observational results. The values of the parameters suggest that the relation at higher velocities is similar to that of ejecta in the crater formation as proposed by Housen et al. (1984), while the relation at slower velocities is that of continuously ejected dusts.

This velocity structure needs some acceleration mechanisms other than the ejection caused by crater formation. The possible mechanisms are,

(1) The expansion of H2O gas evaporated from the ejected dust.

(2) The expansion of gas from the inside of the crater.

Since the observations from Deep Impact and Rosetta spacecrafts suggest the mechanism (1), we discuss whether this mechanism can actually produce the mass - velocity relation estimated from the observations, based on the two-dimensional distribution of silicate materials (Ootsubo et al. in preparation, 2006) and the results of the optical polarimetry (Furusyo et al. in preparation 2006).

In summary, we estimate the mass - velocity relation of ejected dust based on the observational data of the light flux. This suggests that there are some acceleration mechanisms other than the ejection by crater formation.