

Imaging Polarimetry of 9P/Tempel as Taiwan-Japan Collaboration for Ground-based Observation of the NASA Deep Impact Mission

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The NASA Deep Impact mission, the in situ impact experiment on the cometary nucleus of 9P/Tempel, has succeeded on July 4th, 2005. This impact event has been observed by observatories all over the world as well as the Deep Impact space-craft.

We, Taiwan-Japan collaboration observing team, have observed the dust grains ejected by the NASA Deep Impact event by using Lulin One-meter Telescope (LOT, National Central University, Taiwan) and Polarimetric Imaging instrument (PICO, developed by Japan group).

The longitude of East Asia is important to monitor the phenomena caused by the impact. At the time of impact, Hawaii was the best place to observe it. However, the observatories at Hawaii could not observe the comet after 3 hours from the impact. On the other hand, we could observe the comet about 6 hours after the impact event from Taiwan.

The observational results of July 3rd, 4th (about 6 hours later from the impact) and 5th were obtained.

There is no structure on polarization map of pre-impact (July 3rd). Polarization degree is a typical value of comets (about 8%). There is no significant structure on polarization map of post-impact (July 5th). On the other hand, in both of intensity and linear polarization maps of July 4th, we can recognize the shell-like structure of impact ejecta. The velocities of ejecta projected to celestial sphere were determined from the motion of the shell structures, which were recognized in both of intensity and polarization maps. Comparing between these intensity and polarization maps, the derived ejecta velocity in the polarization map is faster than that in the intensity map.

We will discuss about the difference of expansion velocity of the impact ejecta recognized in intensity and polarization maps.