Imaging Polarimetry of 9P/Tempel for the Deep Imapct Event

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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 (UT). This impact event has been observed from various observatories all over the world as well as the Deep Impact space-craft. We, Taiwan-Japan collaboration observing team, have performed imaging polarimetry of the comet 9P/Tempel by using Lulin One-meter Telescope (LOT, National Central University, Taiwan) and Polarimetric Imaging instrument (PICO, developed by Japan group). The observation was focused on the dust grains ejected by the Deep Impact event. The longitude of East Asia was important to monitor the phenomena caused by the impact. 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. No significant structure is seen on the polarization map of pre- and post-impact (July 3rd and 5th). Polarization degree is a typical value of comets (about 8%). 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. Comparing between these structures in intensity and polarization maps, the derived velocity of expanding ejecta 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.