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Early Results of Polarimetric Imager for Comets (PICO)

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We developed the optical polarimetric imager (named PICO), for the study on cometary dust grains. PICO is a so-called double-beam type polarimeter for linear polarization with a fixed Wollaston prism and rotatable half wave plate. As the instrument can take two completely linearly polarized images (their position angles of polarization are perpendicular to each other) simultaneously, it keeps accuracy for the variation of sky conditions, altitude of the object, and so on. We report some early results taken by PICO, comet C/2002 T7 (LINEAR), C/2001 Q4 (NEAT), 81P/Gehrels 2, and C/2004 Q4 (Machholz), from 2003 to 2005. I-band (Kron-Cousins) or i'-band (Gunn) filter was used to obtain the images of the reflected sunlight by cometary dust grains, except some data which were taken by using some narrow-band filters for a bright comet only. Especially, a prominent jet feature is seen in the polarization map of comet C/2001 Q4 (NEAT) taken when the comet was near its perihelion.