

Z02 Observations of Fragments Split from Nucleus B of Comet 73P/Schwassmann-Wachmann 3 with Subaru Telescope

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We observed the nucleus B of Comet 73P/Schwassmann-Wachmann 3 on May 3, 2006 UT with a wide-field camera Suprime-Cam of the Subaru Telescope just before the closest approach to the earth on May 12, 2006 UT. Since fragmentation of the nucleus B was reported in April of 2006, fresh fragments were expected to be detected. A total of 54 fragments were discovered in the southwest area of the nucleus B. Carrying out aperture photometry for the fragments, we obtain the power-law index of the cumulative luminosity function $\alpha = 0.222$. If we assume that the CCD flux of a fragment is proportional to the cross section, the equation $q = 5\alpha + 1$ can be derived, where q is the power-law index of the cumulative size distribution, and therefore $q = 2.1$. Due to the large FOV of the camera (34×27 arcmin), we might be able to find old fragments split from the nucleus B before the perihelion passage in 2006. Searching for such old fragments in the image, no object is found; since the limiting magnitude is 24.2 mag, a bare nucleus (i.e. non-active comet) with 13.3m in radius will be detected in the image; however, the real detection limit should be less than the radius 13.3m, because a comet at this heliocentric distance will be active, and the active comet whose magnitude is 24.2 mag has a smaller nucleus than 13.3m in radius due to the brightness of the dust coma.