A SEARCH FOR SMALL ASTEROIDS IN THE COSMOS FIELD

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A certain population of sub-km asteroids are considered to have high inclination because they are selectively perturbed by the Yarkovsky effect. We have searched for small main-belt asteroids in the COSMOS (Cosmic Evolution Survey) field where the ecliptic latitude is about $-10°$ using Suprime-Cam mounted on the Subaru Telescope. A dedicated method was developed for this survey to detect small bodies in two images. By using it, we have detected more than 500 small bodies in 5 deg^2 with the limiting magnitude of i'=24.0 mag. Most of them are sub-km asteroid candidates. Estimated their orbital elements show the known spatial features, such as the Kirkwood gaps, two families, and secular resonance ν_6. Their number density is less than half of that at the ecliptic plane. The slope of the size distribution is 1.20 $\pm$ 0.04 for the asteroids with diameter of 0.4 km to 2 km, consistent with that of sub-km asteroids in the ecliptic plane. These facts do not indicate that the Yarkovsky effect acts effectively to asteroids larger than 0.4 km in diameter.