DEEP-South: Round-the-Clock Physical Characterization and Survey of Small Solar System Bodies in the Southern Sky

M.-J. Kim[1], H.-K. Moon[1], Y.-J. Choi[1], H.-S. Yim[1], D.-G. Roh[1], J. Park[1], H.-J. Lee[1,2], Y.-S. Oh[3], Y.-H. Bae[1], and the DEEP-South Team[1]

[1] Korea Astronomy and Space Science Institute, Daejeon, Republic of Korea
[2] Chungbuk National University, Cheongju, Republic of Korea
[3] School of Space Research, Kyung Hee University, Suwon, Republic of Korea

contact e-mail: *skarma@kasi.re.kr*

Korea Microlensing Telescope Network (KMTNet), which consists of three identical 1.6 m wide-field telescopes with 18k by 18k CCDs, is the first optical survey system of its kind. The three stations (CTIO in Chile, SAAO in South Africa and SSO in Australia) are longitudinally well-separated, and thus have the benefit of 24-hour continuous monitoring of the southern sky. The wide-field and round-the-clock operation capabilities of this network facility are ideal for survey work and the physical characterization of small Solar System bodies. Continuous monitoring of the sky with the KMTNet is considered to be optimized for spin characterization of various kinds of asteroids, including binaries, slow/fast-rotating bodies, non-principal axis rotators, and hence expected to facilitate the debiasing of previously reported lightcurve observations. The DEEP-South (DEep Ecliptic Patrol of Southern sky) team were awarded 45 full nights every year at each site for five years (2015 - 2019) excluding the "bulge season" when the telescope time is exclusively used for exoplanet search. The primary scientific objective of DEEP-South is physical characterization of 70 percent of km-class PHAs until 2019. In order to achieve this goal, we implemented an observation mode called "OC (Opposition Census)" targeting objects around opposition. We present here DEEP-South strategy, observation modes, software subsystem, test runs, early results, and the near terms plans.