Kiso Outer Solar System Survey

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We are now carrying out a near ecliptic wide field survey of large EKBO using 1.05-m Schmidt telescope with 2K CCD camera at the Kiso Observatory, the Institute of Astronomy, Univeristy of Tokyo. Purpose of this survey is to estimate accurately the surface density of bright EKBO whith is still uncertain. We have surveyed 20.5 $\rm deg^2$ of the region so far, and detected no EKBO. The upper limit of the cumulative surface density of EKBO brighter than 21.0 magnitude derived by our survey is $\rm 2.2 \times 10^{-1} deg^{-2}$. We will report the preliminary result of our survey.

Since the discovery of $\rm 1992 QB_1$, more than 200 Edgeworth-Kuiper Belt Objects (hereafter, EKBO) have been detected in the region beyond the orbit of Neptune. These objects are thought to be remnants of the planetesimals that didn't form a giant planets. EKBOs are the objects least thermaly affected by the radiation of the Sun for their large heliocentric distance. It is important to know the basic properties of these primordial bodies to understand the origin and evolution of the solar system, such as size distribution, spatial distribution and physical properties of the surface material. The size distribution of EKBO is important that it reflects on the collisional history of EKBOs themseves. It also provide important information for determining the tensile strength of EKBO and initial condition of the size distribution. We are now carrying out a near ecliptic wide field survey of large EKBO using 1.05-m Schmidt telescope with 2K CCD camera at the Kiso Observatory, the Institute of Astronomy, Univeristy of Tokyo. Purpose of this survey is to estimate accurately the surface density of bright EKBO whith is still uncertain, and determine the whole range of the size distribution. We have surveyed 20.5 $\rm deg^2$ of the region so far, and detected no EKBO. The upper limit of the cumulative surface density of EKBO brighter than 21.0 magnitude derived by our survey is $\rm 2.2 \times 10^{-1} deg^{-2}$. Although the upper limit of the surface density put no restriction on the size distribution of EKBO, we will continue our survey. We assumed the size distribution of EKBO is expressed as a differential power-law, and performed the Monte Carlo simulation. When the size distribution of EKBO is written as $n(r) dr = \Gamma r^{-q} dr$, the index of the power-law q have to be $3.0 < \le q \le 3.5$ to satisfy the previous survey results. Here, $n(r) dr$ is the number of objects with size in the range r to $r + dr$. We will report the preliminary result of our survey.