Large Kuiper Belt Objects:  
The Mauna Kea 8k CCD Survey

David Jewitt  
Institute for Astronomy, 2680 Woodlawn Drive, Honolulu, HI 96822  
jewitt@ifa.hawaii.edu

Jane Luu  
Astronomy Dept., Harvard Univ., 60 Garden St, Cambridge, MA 02138  
luu@cfa.harvard.edu

Chadwick Trujillo  
Institute for Astronomy, 2680 Woodlawn Drive, Honolulu, HI 96822  
chad@ifa.hawaii.edu

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Abstract

We describe a large-area ecliptic survey designed to assess the sky-plane surface density of bright Kuiper Belt Objects. We used a 8192 x 8192 pixel charge-coupled device mosaic to image 51.5 sq. deg. to a 50% detection threshold red magnitude $m_R = 22.5$. Thirteen new Kuiper Belt Objects were identified in the survey, including some of the brightest and, presumably, largest known examples. We use Monte Carlo models to assess the effects of observational bias in our survey and to examine (1) the size distribution of bright objects in the Kuiper Belt, (2) the possible existence of a cutoff in the size distribution at large radii, (3) the intrinsic ratio of Plutinos to non-resonant ("classical") Kuiper Belt Objects, (4) the intrinsic ratio of populations in the 3:2 and 2:1 mean motion resonances and (5) the radial extent of the Kuiper Belt.