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Photometry of Outer-Belt Objects

Gautham Narayan
Illinois Wesleyan University

Linda French, Faculty Advisor
Illinois Wesleyan University

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Oral Presentation O2.3

PHOTOMETRY OF OUTER-BELT OBJECTS

Gautham Narayan and Linda French*
Physics Department, Illinois Wesleyan University

We present results from multi-wavelength observations of outer-belt Asteroids 2067 Aksnes, 15231 Ehdita, 279 Thule and Comet C/2002 CE₁₀ (LINEAR). Formerly classified as Asteroid 2002 CE₁₀, the last object's orbital elements lead to its classification as a member of a group of asteroids called the Damocloids. The Damocloids' orbits are similar to Halley family comets (HFCs), and there is suspicion that the Damocloids are inactive HFC nuclei. Following observations by the Japanese Subaru telescope in August 2003, which determined that 2002 CE₁₀ had a characteristic tail (Takato et al, 2003, IAU Circular 8193), it was re-classified as a comet.

We observed the objects with Kron-Cousins BVRI filters corresponding to the blue, visible, red, and near-IR wavelengths using the 0.9-m SMARTS telescope at the Cerro Tololo Inter-American Observatory during October 2003. Using the image reduction routines (IMRED) of the Image Reduction and Analysis Facility (NOAO X11/IRAF), we removed the bias caused by dark currents, and flat fielded the data to improve the SNR. Instrumental magnitudes for all objects were extracted using the aperture photometry package (APPHOT). Landolt standard stars were used to solve the transformation equations and extract extinction coefficients. Photometric calibration routines (PHOTCAL) allow us to use the extinction coefficients and instrumental magnitudes to determine absolute magnitudes. The rotation period has been determined using the phase dispersion minimization (PDM) algorithm first developed by Stellingwerf (Stellingwerf, R.F., 1978, ApJ 224, 953-960). We place constraints on the size of the objects.