

Title A Dark, Red Spot on 2003 EL61

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Abstract We present high precision, time-resolved optical and near-IR photometry of the large (diameter ~ 2500 km) Kuiper belt object (136108) 2003 EL61. Besides confirming the rapid rotation at period $P = 3.9155 \pm 0.0001$ hr and the peak-to-peak photometric range $\Delta m_R = 0.29 \pm 0.02$ mag, the new data show clear lightcurve asymmetries and subtle but reproducible color variations with rotation (see Figure 1). The color variations and the lightcurve shape cannot be explained simply by modulation due to a rotationally deformed, equilibrium model. Instead, the observed photometric deviations from the best-fit equilibrium model show the existence of a large surface region with an albedo and color different from the mean surface of 2003 EL61. We use light scattering models to explore constraints on the nature of this anomalous region set by the existing data.

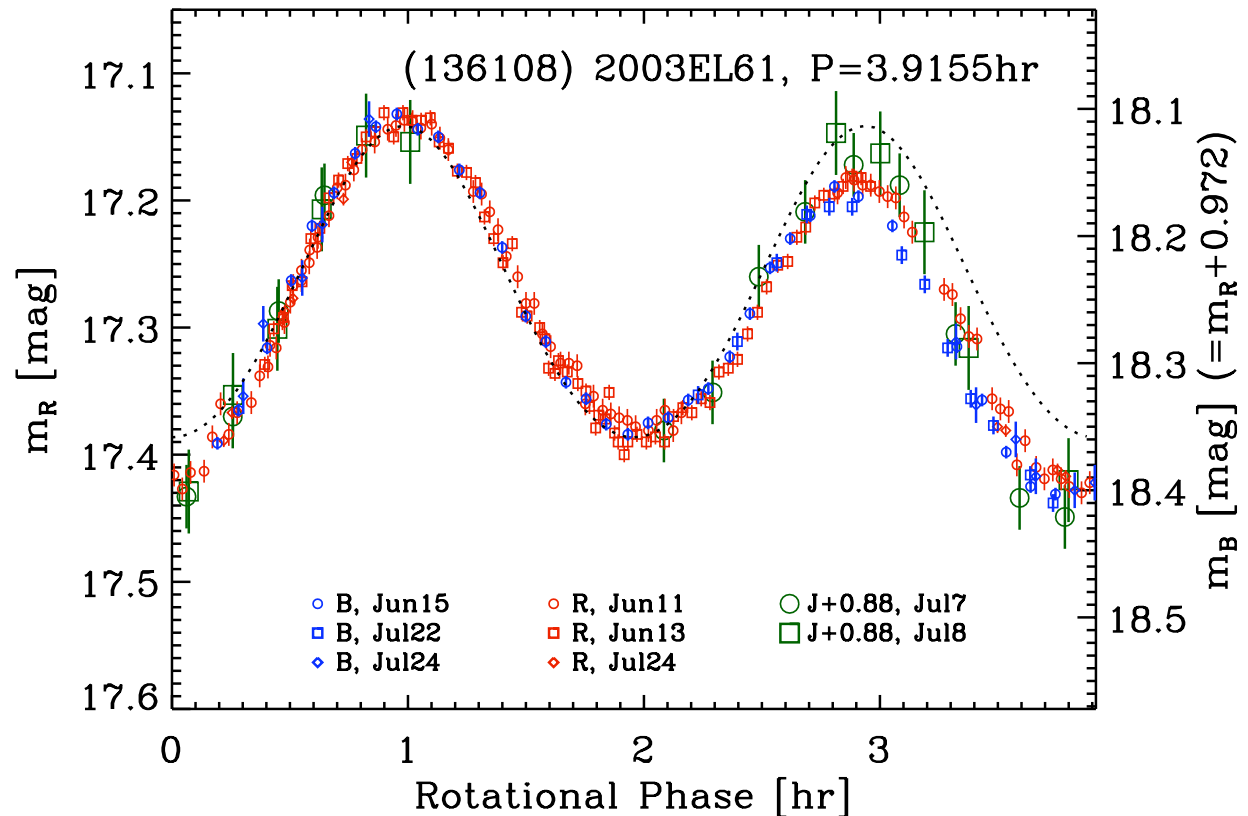


Figure 1: Two-color lightcurve of 2003 EL61. The effects of the dark, red spot are visible in the phase range between approximately 2.7 and 3.9 hrs. The thin, dotted line is the lightcurve of the best-fit triaxial equilibrium model with uniform surface properties.

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