

Electronic Telegram No. 5730

Central Bureau for Astronomical Telegrams

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M. O'Connell, International Occultation Timing Association (IOTA), European Section, reports the discovery of an apparent satellite of the minor planet (8007), based on an occultation of the star UCAC4 354-170588 (which has Gaia catalogued magnitudes $G = 12.07$ and $R = 11.07$) on 2026 July 27.020 UT. This main-belt asteroid had a magnitude of 17.1, which was 5.0 magnitudes fainter than the target star. The observation was made near Valdin, Spain, using a 35-cm telescope (+ Apollo-M Max Pro camera and a personal computer synchronized by Network Time Protocol). The recording, with a limiting magnitude of approximately $G = 14.1$, showed two consecutive occultations lasting 0.21 and 1.32 s, respectively, with a separation of 2.04 s. This corresponds to chord lengths of 1.8 and 11.5 km, and a distance of 17.4 km between the chords. The flux of each drop was lower than that of the comparison star, UCAC4 354-170722, which has Gaia magnitudes of 13.65 (G) and 12.90 (R). The depths of these drops rule out a double star as the cause of the light curve. The sky-plane configuration diagram showing the observed occultation chord is posted at the following website URL: http://www.cbat.eps.harvard.edu/iau/cbet/005700/CBET5730_Fig1.png. The separation of the two bodies was $0''.023$ in p.a. 260 ± 5 degrees, with a sky-plane separation of 24.1 km.

Representative models of the system, as well as the observed and superimposed modeled light curves, are posted at the following website URL: http://www.cbat.eps.harvard.edu/iau/cbet/005700/CBET5730_Fig2.png. The NEOWISE-catalogued diameter of (8007) is 9.0 ± 0.8 km. Assuming that the main body is spherical with a diameter of 11 km, Fresnel modeling of a central chord provides a good fit to the second drop in the light curve. In the upper model (see Figure 2), the minimum size of the apparent satellite is modeled as an ellipse of 3.2 km x 1.9 km. The lower model shows the apparent satellite's maximum size (assuming that it is circular) as having a diameter of 3.5 km.

D. Herald (who forwarded this report to the Central Bureau) and D. Gault, Trans-Tasman Occultation Alliance; and C. Weber, European Section, International Occultation Timing Association, all aided in the analysis. The reader is also referred to the end notes on CBET 5679.

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