

Astrometry And Photometry Of The Dart Space Mission Object Asteroid (65803) Didymos In Lisnyky

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(65803) Didymos is a binary asteroid of spectral class S with a primary diameter of 0.78 km and a secondary diameter of 0.15 km. (65803) Didymos was the target of NASA's DART mission (2022), the Italian Space Agency's LICIACube mission (2022), and is the target of the European Space Agency's upcoming Hera mission (2026).

In this work, we present the results of our observations (65803) Didymos on 16 and 1 November 2022, when the object had a pronounced tail of particles after the DART impact on 26 September 2022. Our observations were obtained using a 0.7-meter (f/4) reflector AZT-8 and Moravian-C4 16000 CCD camera, in Johnson-Cousins V, R and I filters at the Lisnyky observatory station (Code MPC -585). For measurements, the Astrometrica 4 software was used with the Gaia DR2 star catalog. During the two nights, 80 images were taken, of which 73 were used for astrometric measurements, 60 for photometric measurements.

For 2022 10 16.06 (UT) 24 astrometric observations were published in circular MPS 1816756; mean RA residual $-0.2700.299 \text{ dec} - 0.069 \pm 0.184$. For 2022 11 01.02 (UT) 49 observations were published in MPS 1729252; mean RA residual $-0.131 \pm 0.161 \text{ dec} 0.023 \pm 0.180$.

The photometric part is to estimate the length of the visible tail formed after the impact with the DART. Results as of 2022 10 16: for V ($2' 10'' \pm 5''$, $PA 277, 3 \pm 0, 586^\circ$). Accordingly, for 2022 10 31: for V ($2' 12'' \pm 2''$, $PA 277, 9 \pm 0, 170^\circ$), R ($4' 14'' \pm 2, 5''$, $PA 277, 3 \pm 0, 164^\circ$), I ($2' 28'' \pm 6''$, $PA 276, 6 \pm 0, 690^\circ$). The values of the visible tail in km 16.10.2022: for V ($10274 \pm 414 \text{ km}$). Accordingly, for 31.10.2022: for V ($10359 \pm 161 \text{ km}$), R ($20092 \pm 202 \text{ km}$), I ($11668 \pm 495 \text{ km}$).

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