



The fast rotation of Orcus obtained from TESS measurements

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(90482) Orcus is one of the largest Kuiper belt objects, with one known, relatively large satellite, Vanth. There have been several ~ 10 -20h rotation periods reported in the literature for Orcus, with considerable uncertainty. Here we report on recent measurements of Orcus with the TESS Space Telescope providing a light curve period of 7 h, the fastest rotation among those large trans-Neptunian objects for which the rotation is not expected to cause a distorted, triaxial ellipsoid shape, like in the case of Haumea. While moons of large Kuiper belt objects are usually assumed to be formed from an original large body via collisions, the fast rotation may point to a scenario in which Vanth was captured from a nearby heliocentric orbit early in the history of the Solar system, and subsequent tidal evolution led to the present, nearly circular orbit. In this sense the Orcus-Vanth system is peculiar, as the present rotational characteristics and satellite orbits of all other large Kuiper belt objects are consistent with a collisional origin.