

The measured Pluto-Charon offset from the stellar occultations of 23 June 2011

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Abstract

We report on our Charon results from the double occultation observed on 23 June 2011 [1,2,3]. Our group successfully observed the occultation of the same star, 2UCAC 24677089, by Pluto and Charon shown in Figure 1. Charon occulted the star first, and its shadow was offset from that of Pluto by about 1200 km to the north. Thus, observers on the big island of Hawaii and along most of Baja were in the double-occultation zone, where occultations by both Pluto and Charon could be observed. Observers were located around the globe for this event. In Table 1 we list the sites and instruments used. Using GPS-triggered instrument MORIS [4] at the NASA Infrared Telescope Facility (IRTF), we were able to record both occultations within approximately 11 minutes of each other. We obtained Charon-only light curves at an additional three sites. Observations at Leeward Community College on Oahu were made using a GPS-triggered Portable Occultation, Eclipse, and Transit System (POETS [5]). Observers at Table Mountain Observatory (CA) used a GPS-triggered Portable Instrument for Capturing Occultations (PICO [6]). Data were acquired at the U. S. Naval Observatory – Flagstaff Station (AZ) with the USNO Array Camera, an array of six 2k by 4k chips by e2v.

We will analyze these data to solve for the shape and size of Charon as well as to how its position relative to Pluto compares to the JPL PLU017 ephemeris.

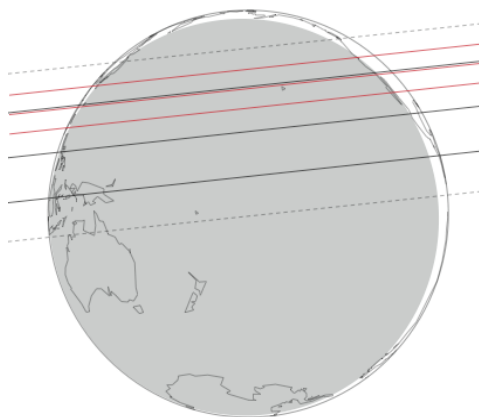


Figure 1: MIT prediction for the 23 June 2011 occultation. The three solid lines correspond to the northern limit, centerline, and southern limit of Pluto (black) and Charon (red). The upper and lower dashed lines represent the 3-sigma error in Pluto's prediction.

Table

Table 1: Sites from 23 June 2011 Occultation

Site	Telescope Aperture (m)	Instrument
Cabrillo Obs., CA	0.3	Own
Cairns, AU	0.4	POETS
Grove Creek Obs, AU	0.25	PICO
IRTF, HI	3.0	MORIS
Leeward Community College, HI	0.5	POETS
Mt. Stromlo, AU	1.8	Own
SOFIA	2.5	HIPO [7]
Sydney, AU	0.25	Own
Reedy Creek, AU	0.25	Own
Running Springs, CA	0.36	Own
Table Mount. Obs., CA	0.61	PICO
Windward Community College, HI	0.4	POETS
U.S. Naval Observatory	1.5	Own
Flagstaff Station, AZ		
Werring, AU	0.25	Own

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