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Physical properties of Hi‘iaka from stellar occultation data

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Two very bright stellar occultations by Hi'iaka, the largest satellite of the dwarf planet Haumea, were predicted to take place during in April 2021. Since the uncertainty on Hi'iaka's shadow path was large due to uncertainty on Hi'iaka's position with respect to Haumea, we performed an observational campaign using medium-sized telescopes to obtain high accuracy astrometric data of Hi'iaka's orbit around Haumea. The astrometric data allowed us to successfully observe the first stellar occultation on April 6^{th}, with final path crossing North Africa. We only obtained one positive chord in this event from the TRAPPIST-North telescope at Oukaïmeden Observatory (Morocco), but thanks to this detection, we were able to obtain a more accurate path for the second event on April 16^{th}. The second shadow path was predicted to cross the continental US from East to West. We carried out a huge observational campaign involving more than 50 professional and amateur observatories across the US and southern Canada. The final path of this second stellar occultation moved slightly to the North of the predicted path and, as a result, we were able to obtain 5 positive chords and negative chords only from the south of the shadow. We also collected photometric data in order to obtain Hi'iaka's rotational light-curve and calculate its three-dimensional shape. The rotational light-curve was obtained by observing the unresolved system of Haumea-Hi'iaka and removing Haumea's rotational light-curve from the data. Using Hi'iaka's rotational light-curve we obtained the rotational phase at which each stellar occultation took place, which allowed us to obtain a three-dimensional model of the satellite. Preliminary results from the stellar occultation show that Hi'iaka, with a triaxial shape as suggested in previous publications, is larger than what has been thought before and with a similar albedo to that of Haumea. In this talk we will present our analysis and preliminary results of some of Hi'iaka's physical properties.