Multichord observations of Pluto and Varuna in 2010

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The goals of observing stellar occultations by Trans-Neptunian Objects (TNO's) are (1) to measure TNO's sizes and shapes at sub-km accuracy (1 mas ~ 20-40 km) ; (2) to derive density for bodies with satellites ; (3) to detect atmospheres at the nbar level ; (4) to improve ephemeris accuracy at mas level.

Our main challenges are : (1) predictions, as TNO's apparent diameters ~ 30-100 mas for largest bodies ; (2) HIP and TYC catalogs degrade due to p.m. uncertainties, and are limited to brighter stars (mag. 11-12) ; (3) UCAC2 catalog good only to ~ 30-50 mas. Sub-mas accuracy on candidate stars allows us to predict events at > 90% level for largest TNO's, deploy stations at right places with several stations across shadow, and associate larger facilities in the campaigns.

In this talk we will discuss two recent positive campaigns :

- Pluto occultation of Feb. 14 in Europe

- Varuna occultation of Feb. 19 in Brazil and Namibia

References

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