

## Pro-Am observations of mutual events between the Galilean satellites during the PHEMU09 campaign from Greece

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The solar system is a dynamic place, replete with time-variable phenomena. Their monitoring on a regular basis provides insight into the processes that have driven its formation and evolution and continue to operate in the present. Since 1973, the Institut de Mécanique Céleste et de Calcul des Éphémérides (IMCCE) has organised worldwide observing campaigns to record the mutual eclipses and occultations between the satellites of Jupiter, Saturn and Uranus [2]. The aim is to improve the satellite ephemerides and to detect the secular acceleration of the satellites' orbits. This knowledge, in turn, constrains those moons' past orbital and geological evolution and helps scientists probe the structure of their interiors [3].

The subject of this presentation is a pro-am collaboration to record a number of mutual events between the Galilean satellites of Jupiter from Greece during the PHEMU09 campaign [1]. It involved four amateur and two professional astronomers observing with both portable and fixed-site instruments equipped with CCD cameras at prime focus. The observations took place between May and August 2009. Observations of 21 events were attempted, resulting in usable lightcurves for 15. This contribution will summarise the scientific rationale for the observations, describe the observations themselves, identify lessons learned and outline plans for the next campaign in 2014-15.

### Acknowledgements

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### References

- [1] Arlot, J.-E.: Predictions of the mutual events of the Galilean Satellites of Jupiter occurring in 2009-2010, *Astron. Astrophys.*, Vol. 478, pp. 285-298, 2008.

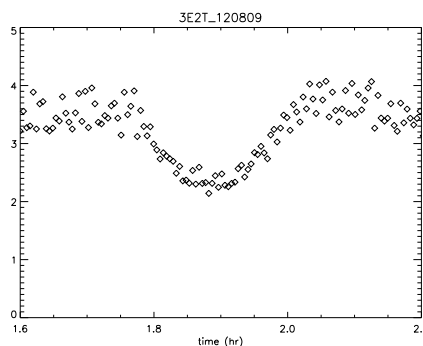


Figure 1: An example of an observation of a mutual event obtained with a small telescope. This lightcurve of an eclipse of Europa by Ganymede was obtained by one of the authors (AD) on the 12th Aug 2009 from Mt Parnon (Elev: 1400m) in the Peloponesian peninsula using a Meade LX-200 Schmidt-Cassegrain telescope (D=25cm, f/10), an SBIG ST-7 CCD camera and an Astrodon V filter. The quantity plotted is the intensity of Europa divided over that of Callisto.

- [2] Arlot, J.-E., Events Observers, Mutual: Thirty Years of Natural Satellites Mutual Events Observations, 41st DPS Meeting, Ithaca, NY, USA, 2009.
- [3] Lainey, V., Arlot, J.-E., Karatekin, Ö., van Hoolst, T.: Strong dissipation in Io and Jupiter from astrometric observations, *Nature*, Vol. 459, pp. 957-959, 2009.