Lightcurves of two Jupiter Trojan asteroids with long period M.D:Melita[1], F. dos Reis[1], F. Yoshida[2], S. Abe[3] and R.. Duffard[4], [1]IAFE (CONICET-UBA). Argentina, [2] NAOJ, Japan,[3]Lulin Observatory, Taiwan, [4]OSN and AA, Spain.

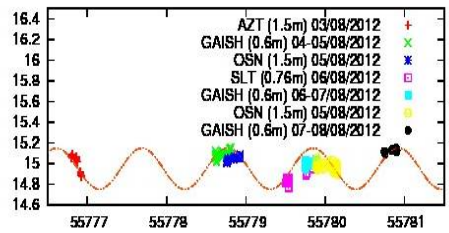
Introduction: We determined the light curves of two Jupiter Trojan asteroids, (16070) 1999 RB101 and (1867) Deiphobus. We synchronized over 9 nights of observations in total, made in telescopes of the Observatory of Sierra Nevada (Spain), Lulin (Taiwan) and Maidanak (Uzbekistan), to try to determine a curve that contains most of the phase of these objects. The reduction was performed using photometric Landolt standard stars. In cases where the standard reduction was not possible standard, we used field stars with values in the R filter contained in the catalog NOMAD1. For (16070) 1999 RB101 we found periods of 52.80hs or 26.40hs and for (1867) a value of 51.70hs, which does not exactly match the value given in the appearance 1994 (Mottola et al 2011). The amplitudes found were 0.3 and 0.4 mag respectively.

Methods: To calibrate the images we used the "Image Reduction and Analysis Facility" (IRAF). Usual calibration was performed with bias, dark (when present) and flat images. The photometry was performed using the tasks PHOT and DAOFIND from the DAOPHOT package, with a circular aperture that was set analyzing the profiles of objects for each night of observation. When standard photometry was not possible we used the average instrumental magnitude of 8 stars in the field and adding the average magnitude of the same catalog NOMAD(Naval Observatory Astrometric Dataset Mergered (see Table 2).

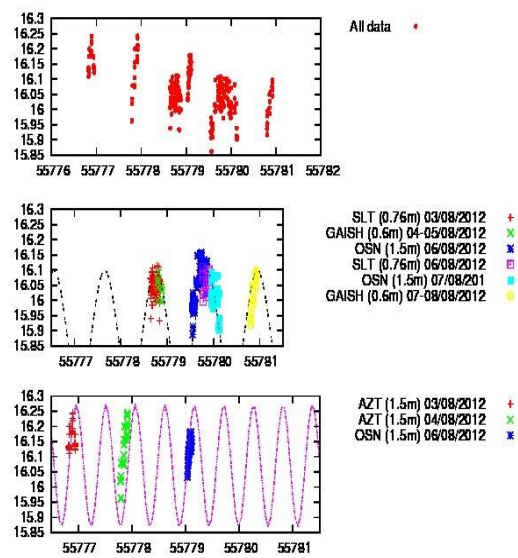
Once the time series was obtained, it was analyzed with methods for detecting periodicity in a series with data not equally spaced in time. We used a method that minimizes a givenentropy function, such as the Phase ispersion Minimization (Stelingwerf 1978) and method based on Fourier analysis such as the modified periodogram of Lomb - Scargle (Lomb 1976). Since our data have a significant dispersion, is the "smoothed" using a median filter with sliding window, thus high spurious periods were removed.

Results: The following section discusses the results for both objects. The figures below show our results with a sin plot with the corresponding period and amplitude.

(1867) Deiphobus: At the 1994, Mottolla et al. (2011) determined a period of 58.66hs and amplitude of 0.27 mag. We find that the period that best fits the data of each night is 51.7 hours with an amplitude of 0.4mag. Furthermore, this value of period corresponds approximately to twice the peak power of Lomb-Scargle periodogram and a minimum coefficient PDM, although this ratio appears to be very degenerate for values over 48 hours.



(16070) RB101: This is the first determination period for this object. The curve has peaks which are not symmetrical or amplitude or time. We found that the peak of the Lomb-Scargle periodogram suggests a period of two peaks of different heights of just over 26hs. If this proves a double peak structure of 1 single maximum, the period would then 52.80hs. 28hs a period of approximately corresponds to an overall minimum and has a coefficient PDM local míninmo around 52.80hs. In the light curve can be seen as the peak corresponding to the observations of AZT (1.5m) of 04/08/201 not be synchronized exactly with a period of 26.4hs, suggesting that the period is actually twice that value.



References:
Lomb, N.R., 1976 Ap&SS, 39, 447.
Mottola, S. et al. 2011 The Astronomical Journal. 141, 170.