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**UNSUCCESSFUL OPTICAL SEARCH FOR THE 0.006223HZ PULSAR
FREQUENCY FROM THE X-RAY BINARY MX0656-072**

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The Be X-Ray binary MX0656-072 was discovered as an X-Ray pulsar during the outburst of October 21, 2003 (Remillard et al., 2003), with a pulse period of 160.7s (Morgan et al., 2003; Heindl et al., 2004). We observed the optical counterpart of this source in November 2003 with the OGS ESA telescope and the IAC CCD camera at the Izaña Observatory in Tenerife to verify if the pulsar signal could be observed also in the optical band. We obtained 111 frames in B light with exposure time of 30s on November 10 and 154 frames with exposure time of 20s on November 14, 2003; in the same night we got also 430 frames with exposure time of 10s in R light. To have the lowest possible frame transfer time we reduced the image field to a small square containing 4 objects: the target star and the three comparison stars indexed Figure 1. Separate calibration of the comparison objects was obtained in the same nights using additional full field exposures. We performed separate Discrete Fourier Transforms of the magnitudes computed with DAOPHOT from the data obtained in the three runs. We repeated the temporal analysis on a file collecting all B images of the two nights and on a second file collecting all images of the three nights after detrending the nightly mean magnitudes. The frequency of $0.006223\text{Hz} = 537.64779\text{c/d}$, corresponding to the period of 160.7s, is absent in all our analyses, where the spectral power near to the expected frequency results to be particularly low. Figure 2 shows, as example, the spectral power of the R stream of 430 measures performed on November 14, 2003. This result is not surprising because, due to the high luminosity of the Be companion star, the reprocessed signal could be diluted, the phase information could be destroyed by the large reprocessing area; or the X-ray beam could interact weakly with the companion and/or the accretion flux environment.

References:

- Heindl W.A., Rothschild R.E., Coburn W., Staubert R., Wilms J., Kreykenbohm I., Kretschmar P., 2004, *AIP Conf. Proc.*, **714**, 323
Morgan E., Remillard R., Swank J., 2003, *ATEL*, **199**
Remillard R., Marshall F., 2003, *ATEL*, **197**

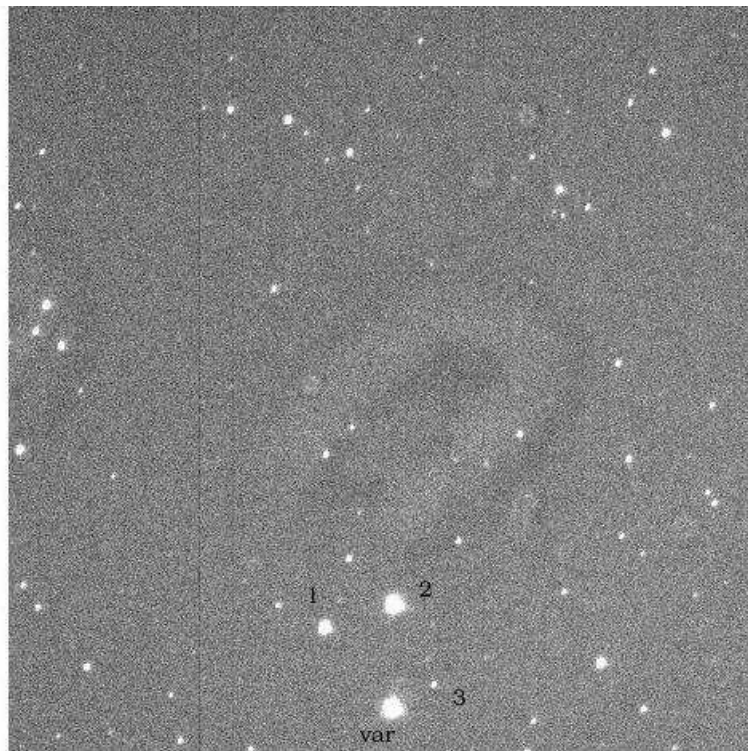


Figure 1. CCD image of the full observation field: the comparison stars are the objects 1, 2 and 3 in the lower central part of the image.

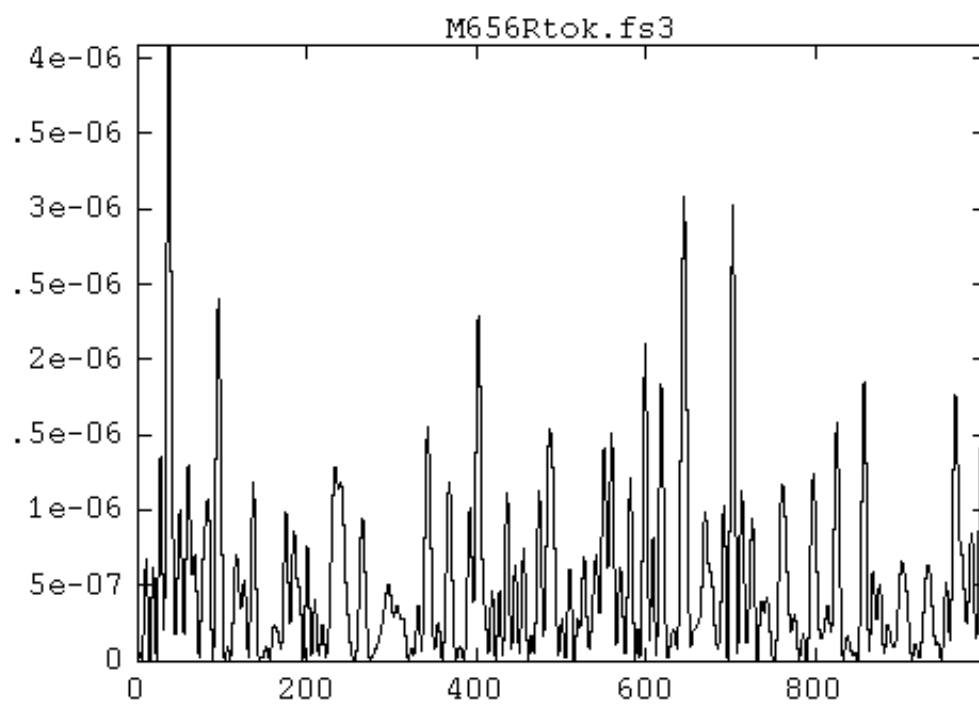


Figure 2. Fourier power spectrum of the observation run of November 14, 2003, performed with R filter, after prewhitening of the two lower frequencies