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FAST PHOTOMETRY OF AE Aqr

We observed AE Aqr photoelectrically starting at $JED_{\odot}$ 2444438.659459 with the 1.6m telescope of the Brazilian Astrophysical Observatory. Fast photometry (1s integration time) was carried out in white light during one hour.

The "16.5s" and "33s" oscillations discovered by Patterson (1979) are present in our data. Fig.1 shows the power spectrum for our observing run.

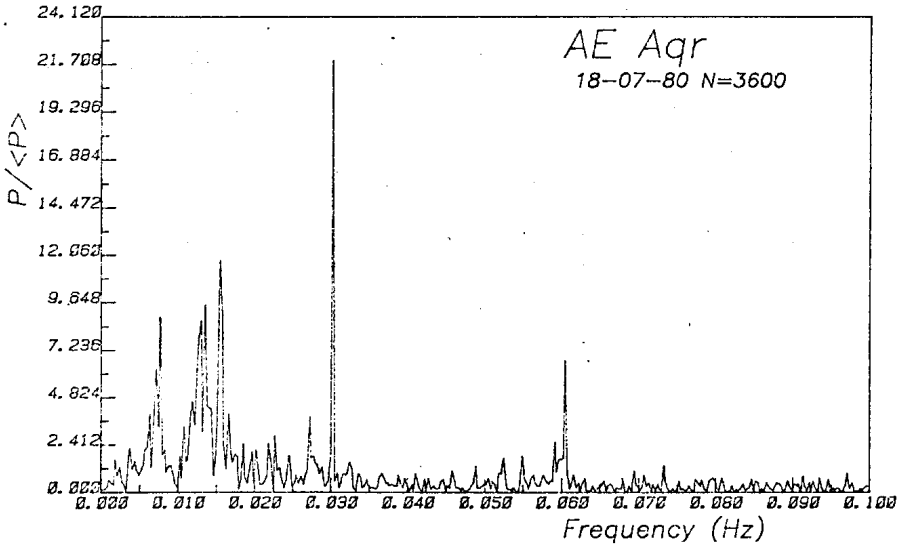

Fig.1. Power spectrum of AE Aqr. Ordinates are power in bin/mean power in the spectrum. The low frequencies were suppressed with a high-pass filter.

We have derived a mean time for the maxima of the "16.5" oscillations, once the effect of the time delay due to the orbital motion of the pulsating source during the observation was subtracted;

Max. light at $JED_{\odot}$ 2444438.659610 (1)
(±2)

Using the ephemeris given by Patterson (1979)

Max. light at $JED_{\odot}$ $2443668.915387+1.91416306 \times 10^{-4}E$
±3 (±20)

we found a residue of .569 cycles after 4021309 cycles of the "16.5s" oscillation. This residue would make the cycle counting insecure in normal conditions; but AE Aqr displays an additional feature that we can use: the "main" pulse of the "33s" oscillation has always an even cycle number. As it can be seen in Fig.2, the first pulse in our observing run is the "main" one, and so, should have an even cycle number (4021310).

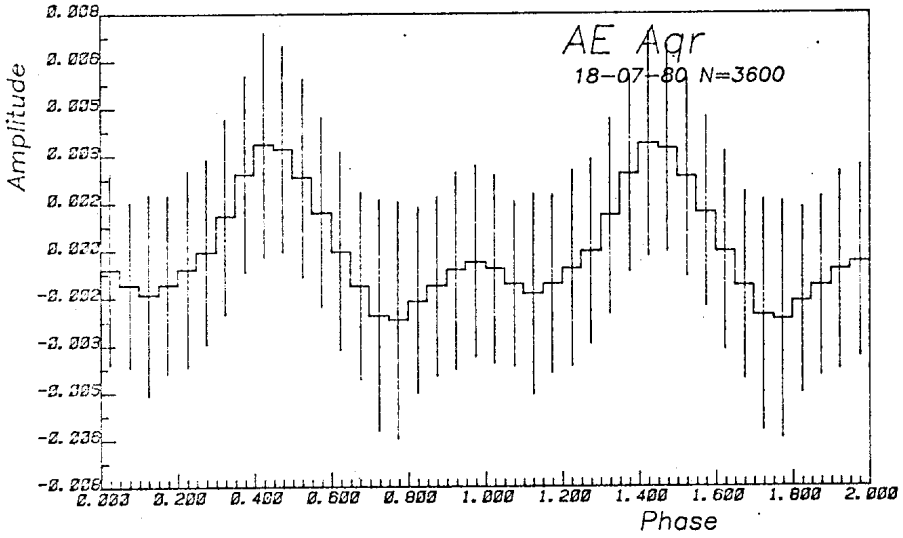

Fig.2. Mean light curve for the "33s" oscillation in AE Aqr. Amplitude is given in magnitudes.

Assuming $\dot{P}$ to be small enough to be detected yet, a correction can be set to the period given in (1)

Best $P = 1.91416285 \times 10^{-4}$d.
(±4)

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Reference:
Patterson, J. 1979, Astrophys.J.234, 978