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18-MIN. LIGHT-VARIATIONS OF HZ 29

HZ 29, a peculiar hydrogen-deficient white dwarf (Greenstein and Matthews 1957), was observed photoelectrically by the writer on eight nights in 1962 using the Crossley reflector of the Luck Observatory; at the writer's request the star was observed also on a single night by Dr. W. Krzeminski with the 42-inch reflector of the Lowell Observatory. The visual inspection of all the tracings led to the conclusion that on some occasions quasi-periodic variations were present with the amplitude of the order of a few hundredths of a magnitude and period of about 9 minutes (Whitford 1962). The entire photoelectric material has recently been re-analysed by means of the autocorrelation technique and the surprising result has been obtained that the light variations of HZ 29 have strictly periodic character, their period being equal to about 18 minutes (instead of 9 minutes suspected previously). The apparent lack of periodicity in some tracings was entirely due to the instrumental "noise" which heavily masked the star's intrinsic variation. The latter is seldom visible on the original tracings and become apparent only in the composite light curves based on several individual cycles (see Fig. 1).

A detailed account of the photoelectric observations of HZ 29 and their analysis will be given in an extensive paper to appear in the forthcoming issue of "Acta Astronomica" (Vol. 17, Number 3, 1967). Here I wish to present the more important points.

1. The light curve of HZ 29 has a shape of a slightly distorted double sinusoid (see Fig. 1). The secondary minimum is shifted toward $0^{\text{P}}.6$ and slightly shallower than the primary. The amplitude amounts to about 0.05 mag. in the ultraviolet and to about 0.03 mag. in the blue; no yellow observations were available.

2. No definite interpretations of these variations can be offered at present though it is tempting to advance a hypothesis of the binary nature of HZ 29. The double structure of the absorption lines of helium (Greenstein and Matthews 1957) could then be interpreted in terms of the large amplitude radial velocity variations averaged over time during the relatively long exposure. A direct spectroscopic test of this hypothesis will be rather difficult but seems entirely possible.

3. More photometric observations are urgently needed in order to determine a more accurate value of period and to study its stability.

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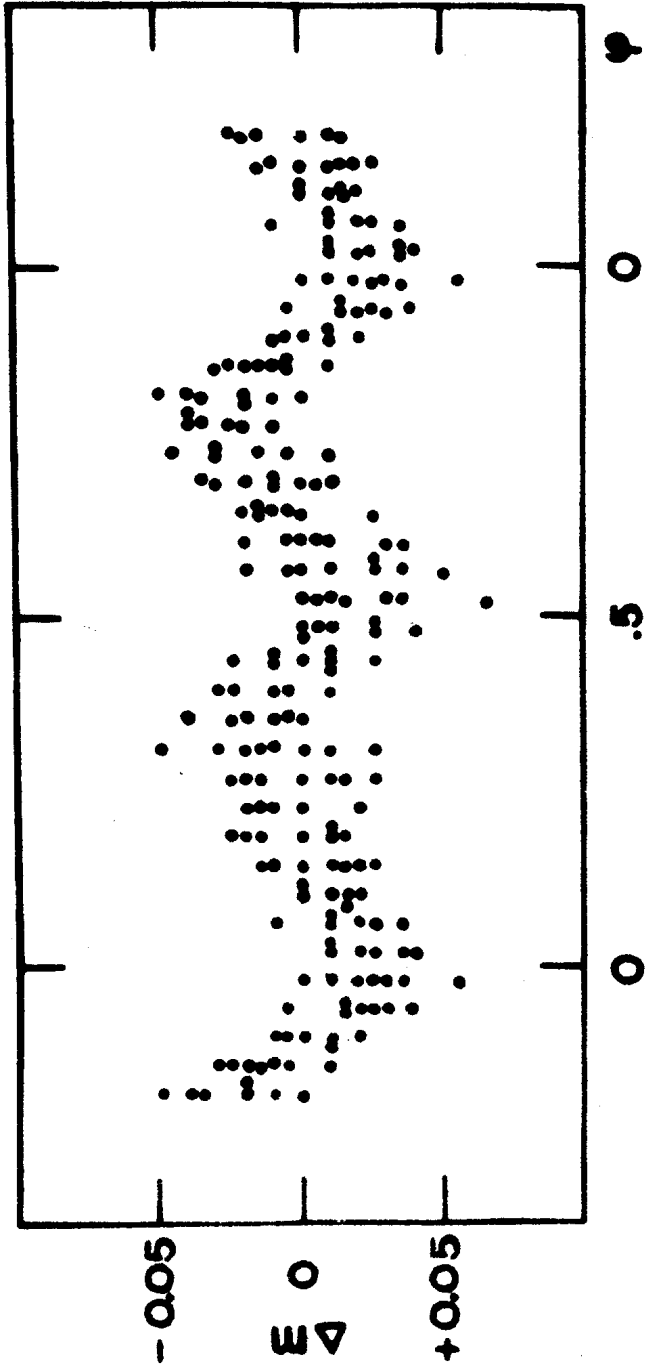


Fig 1.
 Composite ultraviolet light curve of HZ 29 based on 185 observations
 made on February 4 UT, 1962
 Phases were computed using $P = 0.0122$ day