A REFINEMENT OF LINEAR ELEMENTS FOR
EL COMAE BERENICES

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Abstract

The RR Lyrae variable EL Comae Berenices was examined on photographic plates of the Maria Mitchell Observatory in the interval 1981 through 1988 to verify and refine its elements. The new elements are

$$JD_{(max)} = 2445508.295 + 0.522832 \text{ E.}$$

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In the fourth edition of the **General Catalogue of Variable Stars** (Kholopov et al. 1985), EL Comae Berenices is listed as a variable of type RRab with the elements

$$JD_{(max)} = 2438532.557 + 0.343329 \text{ E.} \tag{1}$$

In 1972, however, Henry had noted that a period of 0.52362 day fit her data nearly as well. Wheatley (1982) concluded that the previously accepted 0.343329-day period has characteristics of a spurious period while his adopted period of 0.52285 day does not. He pointed out that his adopted period differs from 0.52362 day by close to one cycle per year; an ambiguity of this sort is common in short period stars such as EL Com.

Current data gathered from photographic plates taken at the Maria Mitchell Observatory (MMO) from 1981 to 1988 support Wheatley's preferred period of 0.52285 day and provide an increase in precision. Figure 1 shows an O-C graph of these data and Wheatley's unpublished MMO data from the interval 1979 through 1980. In Figure 1, C is defined as

$$JD_{(max)} = 2443738.118 + 0.52285 \text{ E.} \tag{2}$$

On the graph each data point represents one season of observations. The values of O-C and the lengths of the error bars were determined by a non-linear least-squares method (Belserene 1986). There is no point for 1983 because there were too few MMO plates of the region to determine an O-C for that year.

The line which best satisfies the data points was calculated using the least squares method. The negative slope indicates that the star has a period somewhat smaller than Wheatley concluded.

The new elements are:

$$JD_{(max)} = 2445508.295 + 0.522832 \text{ E.} \tag{3}$$
$$\pm 0.006 \quad \pm 0.000003$$

There is no evidence for a change in period.

Light curves based on these elements show more scatter than can be attributed to observational errors in the magnitude estimates. This

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scatter, which was also noted by Wheatley (1982), indicates the possibility of second period superimposed on the principal one.

REFERENCES

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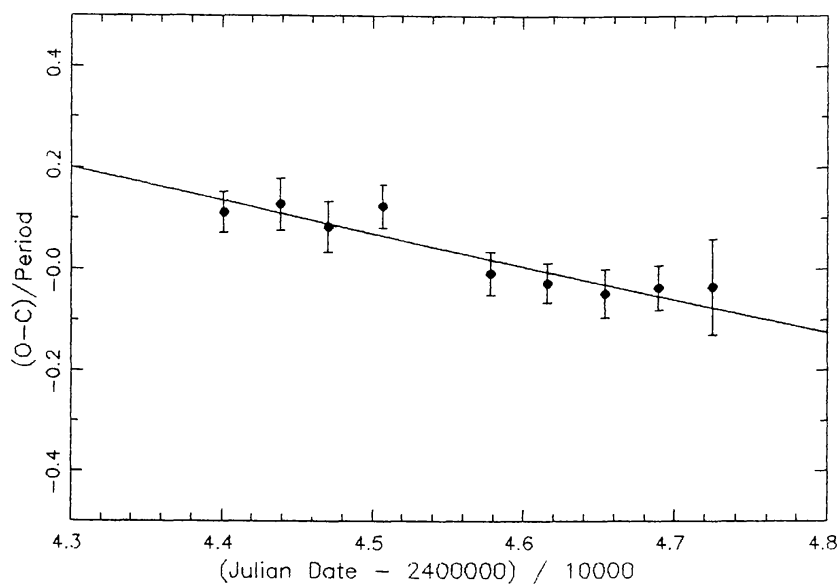

Figure 1. O-C diagram for EL Comae Berenices, where C is defined by the elements in equation (2). The line represents the refined elements in equation (3).