

A POSSIBLE CHANGE IN THE PERIOD OF HS AQUILAE

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Abstract

The period of the long-period variable, HS Aquilae, has been determined from photographs in the interval 1917-1980, and the recent residuals are found to deviate from the 267-day period determined by Harwood. Due to a large gap in the data during the 1950s and 1960s, it is not possible to tell whether the deviations are caused by an increase or a decrease of the period.

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A period of 267 days was determined in 1962 by Margaret Harwood for the long period variable HS Aquilae. A study of this variable during the summer of 1980 using Maria Mitchell Observatory plates from 1917 to 1980 produced the "Observed Minus Calculated" (O-C) diagram in Figure 1. Its somewhat unconventional format--that of plotting ascending and descending branches separately from the maximum--arises from three contributing factors: (1) the variable's period is long, (2) observations are limited to a few months each year, and (3) the variable is only above the plate limit of 12 to 15 magnitudes near its maximum.

A large gap occurs during the late 1950's and the 1960's (from 26 to 56 or 57 periods past the epoch) when both Maria Mitchell Observatory and the Harvard College Observatory had virtually no observations in this region. During this time the variable exhibits a change in period. Because of the gap in observations, the exact number of periods between JD 2434869 and JD 2443047 is unknown. The upper group of observations in Figure 1 (starting at 56 periods past the epoch) corresponds to 30 periods, while the lower group corresponds to 31 periods.

The straight diagonal line represents a period of 267 days, as determined by Margaret Harwood. It is possible that a small increase in period sometime during the gap in observations would cause the upper group of points to be shifted above the line as shown. On the other hand, the leveling trend apparent in the observations during the 1950's (starting at 18 periods past the epoch), and the distribution of the later points suggest the variable period represented by the curved line through the lower points. This period ranges from 267 days in the 1930's, through 263.8 days in the late 1950's, to approximately 260 days in the 1970's.

More definite results will have to await the acquisition of more data, both on the future activity of the variable, and that acquired elsewhere during the period of little observation at Maria Mitchell. Any information on HS Aquilae during this period would be greatly appreciated.

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REFERENCE

Harwood, M. 1962, Ann. Leiden Obs. 21, 38.

