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NOTE ON GAMMA BOOTIS

In "The General Catalogue of Variable Stars" Kukarkin et al.(1) have classified Gamma Bootis as an unstudied variable and stated that its brightness variations can from time to time be represented with the period of $0^d.2903137$.

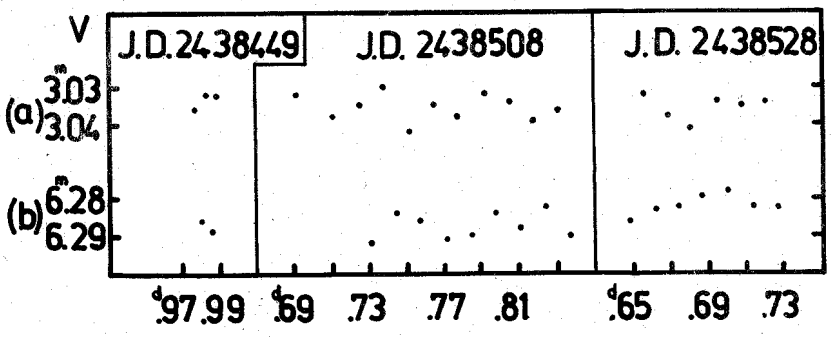

Fig.1.
The V magnitudes of (a) Gamma Bootis, and (b) HR 5402 plotted against Julian date

The star was observed by the present writer in the spring of 1964 with a photoelectric photometer attached to Lowell Observatory's 21-inch reflecting telescope. A 1P21 refrigerated photomultiplier tube and standard BV filters were used. The V magnitude and (B-V) colour index of the comparison star, HR 5441, were determined on two nights - they are equal to $6^{m}.390 \pm 0^{m}.005$ and $0^{m}.523 \pm 0^{m}.003$, respectively (mean errors estimated). The results of the differential observations of Gamma Bootis, as well as of the check star, HR 5402, reduced in the usual way, are shown in Figs.1 and 2. Each point was derived from two comparisons

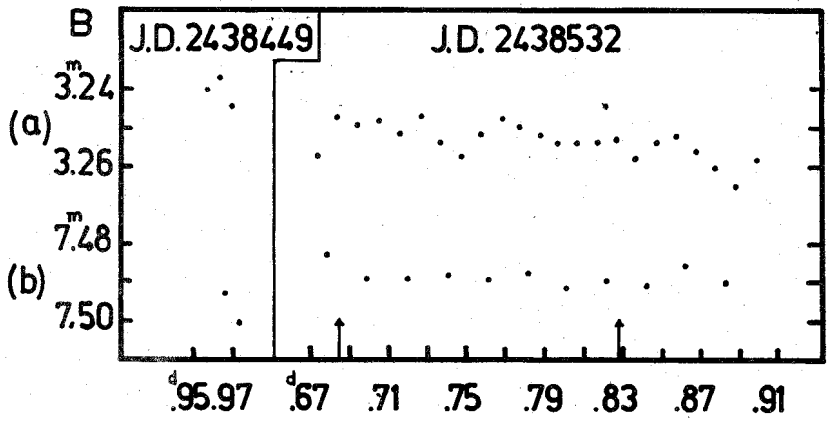

Fig. 2.

The B magnitudes of (a) Gamma Bootis, and (b) HR 5402 plotted against Julian date. The arrows indicate phases 0 and 0.5, computed according to elements (I)

"Gamma Boo - HR 5441" or "HR 5402 - HR 5441", in the case of the check star. The observations suggest that brightness of Gamma Bootis undergoes rapid fluctuations within about $0^m.01$.

Our result differs greatly from that derived by Magalashvili and Kumsishvili (2) from their photoelectric observations, carried out in the years 1960, 1961 and 1962 at Abastumani Observatory. They found the star's brightness to vary according to the elements

$$\text{Max.} = \text{J.D.}2437020^d.440 + 0^d.2903137\ E, \qquad (I)$$

the amplitudes of the mean light-curves being equal to $0^m.05$ and $0^m.11$ in the yellow and blue light, respectively. It is tempting to conclude that the large brightness variations present in 1960 to 1962 have virtually ceased in 1964. Such a conclusion may not be the correct one, however, for Magalashvili's and Kumsishvili's result is open to doubt: maxima of their mean light-curves were derived from the 1960 observations alone while the minima - from

observations obtained in the years 1961 and 1962. It seems therefore, that Magalashvili's and Kumsishvili's observations indicate only that Gamma Bootis was by several hundreds of a magnitude brighter in 1960 than in the remaining two years, provided that Beta Bootis, the comparison star they used, was constant. Rapid fluctuations of brightness of Gamma Bootis are also suggested by Magalashvili's and Kumsishvili's observations.

According to our results the V magnitude of HR 5402 is equal to $6^{m}.285$ (see Fig.1). It should be mentioned that this value differs by $0^{m}.1$ from the one quoted in the Yale "Catalogue of Bright Stars" (3).

Wroclaw, Poland
December 3, 1968

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References:

(1) Kukarkin,B.V., Parenago,P.P., Efremov,Yu.I., and Kholopov,P.N., "The General Catalogue of Variable Stars", second edition, Moscow 1968.

(2) Magalashvili,N.L., and Kumsishvili,J.J., Abastumani Astrophys.Obs.Bull. No.32, p.3, 1965.

(3) Hoffleit,Dorrit, "Catalogue of Bright Stars", Yale University Observatory, New Haven, Connecticut, 1964.