

RR ARI: NOT A VARIABLE STAR

(Letter to the Editor)

ENNIO PORETTI

Osservatorio Astronomico di Milano-Merate, Italy

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Abstract. New V standard measures of RR Ari are presented and the star is found not to be variable. The light of the star λ Ari B \equiv CSV 5954 seems also to be constant.

1. Introduction

The variability of RR Ari has been the subject of numerous discussions, but the measures published up to now did not allow any decisive conclusion to be made as to its reality. In the past, contradictory results were found by Gaposchkin (1952) and Archer (1959). The former, on the basis of 785 photographic observations, concluded that the light of the star was constant. The latter, on the basis of 11 photoelectric measures, classified the star as an eclipsing binary with a period of 47.9 d and an amplitude of 0.4 mag. Visual estimates show the star to be constant or with very small variations (Zverev, 1936; and Buzzoni, 1983). The necessity of gathering new data on this star was emphasized by Dworak (1976).

2. New Observations

In the course of a program concerning bright variable stars rarely observed photoelectrically, new measures were made at the Osservatorio Astronomico di Merate from October 1983 to February 1984, with the 50-cm Marcon telescope equipped with a standard V filter, a Lallemand photomultiplier and a chart recorder. A Gardiner-type integrator was also used in 1984.

The measures were made according to the sequence C-V-C-C1-C-V-... using component A of the optical pair λ Ari \equiv HR 559 \equiv ADS 1563 as the comparison star (C) and component B as the check star (C1). As a rule, a measure of the sky background was made every 5 measures of the variable. Altogether, 159 measures of RR Ari and 144 measures of λ Ari B were collected. For the reduction of data, the atmospheric extinction coefficient was calculated nightly. Moreover, the instrumental magnitudes were converted into the standard system by using the V magnitudes and the $B - V$ indices given by Hoffleit (1982) for about a dozen constant stars observed in the course of the program.

Table I lists the mean magnitudes of RR Ari and λ Ari B for each night. These magnitudes have been calculated assuming $V = 4.79$ for λ Ari A. σ is the standard error.

No significant variation appears: the scatter of the mean magnitude is practically the same for both stars and probably caused by instrumental effects.

3. Discussion

The photoelectric measures given here confirm that the light of RR Ari is constant. As an illustration of this, Figure 1 shows the magnitudes listed in Table I in phase with the

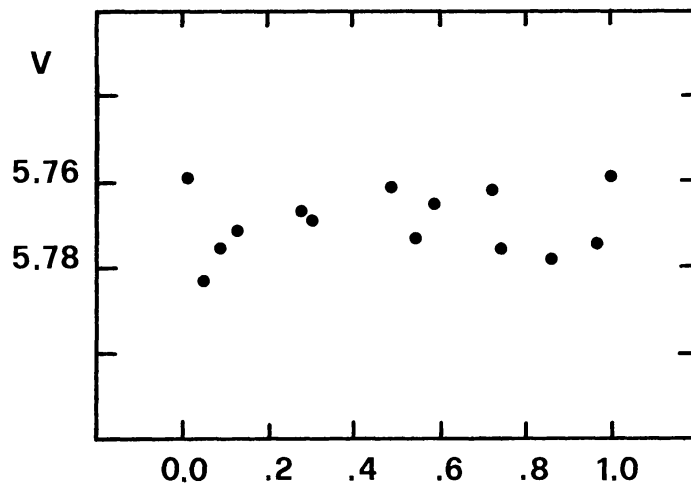


Fig. 1. V magnitudes of RR Ari. The phases are referred to ephemeris $2445\,621.0 + 47.9 \times E$.

TABLE I
 V magnitudes of RR Ari and λ Ari B

Mean J.D.	RR Ari		λ Ari B	
	V	σ	V	σ
2445 621.44	5.759	0.003	7.326	0.005
625.44	5.775	0.002	7.333	0.003
627.42	5.771	0.002	7.334	0.005
634.42	5.767	0.003	7.326	0.005
635.44	5.769	0.003	7.327	0.003
647.45	5.773	0.003	7.336	0.004
655.38	5.762	0.006	7.334	0.003
667.39	5.775	0.002	7.332	0.004
671.40	5.783	0.003	7.347	0.003
677.41	5.780	0.002	7.331	0.003
.44	5.779	0.002	7.332	0.006
697.33	5.765	0.002	7.345	0.004
704.31	5.776	0.002	7.334	0.004
710.29	5.778	0.007	7.333	0.003
740.28	5.761	0.004	7.332	0.005

period published by Archer. Although the cycle is not entirely covered, it is practically impossible to suppose the existence of two minima with a depth of 0.4 mag. and 0.3 mag., a duration of 0.08 p and 0.55 p apart. Moreover, the variations of a possible eclipsing variable would hardly have escaped detection by the photographic measures of Gaposchkin (1952).

Furthermore, it appears clearly that RR Ari does not display the irregular fluctuations typical of an L- or SR-type star. This result confirms the necessity already pointed out by Hoffleit (1979) for the photoelectric observation of little observed bright stars. The star λ Ari B \equiv ADS 1563 B has also been suspected of being variable and is listed in catalogues as CSV 5954 \equiv NSV 680. However, the measures listed in Table I confirm the conclusion of Kholopov (1982) that the light of this star is constant; and that, accordingly, RR Ari should be removed from the lists of variable stars.

Acknowledgements

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