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PHOTOELECTRIC OBSERVATIONS OF β ARIETIS

β Arietis has been known as a spectroscopic binary star with a highly eccentric orbit of e=0.892 (Petrie 1938), and it was suspected by Dommanget that it might have light variation due to a periastron effect. The first photoelectric observation was made by Lovell and Hall (1971) for light variation, but they concluded from their fifteen observations that there is no periastron effect larger than about $0^m.01$. In view of rather small number of their observations,we made further BV photoelectric observations in order to check their conclusion. Our observations were made on sixteen nights in 1972-73 with the 8-inch refractor at the Education Centre of Kanagawa Prefecture. In these observations, $\gamma^1+\gamma^2$ Arietis was used as the comparison star, which was the same one as used by Lovell and Hall.

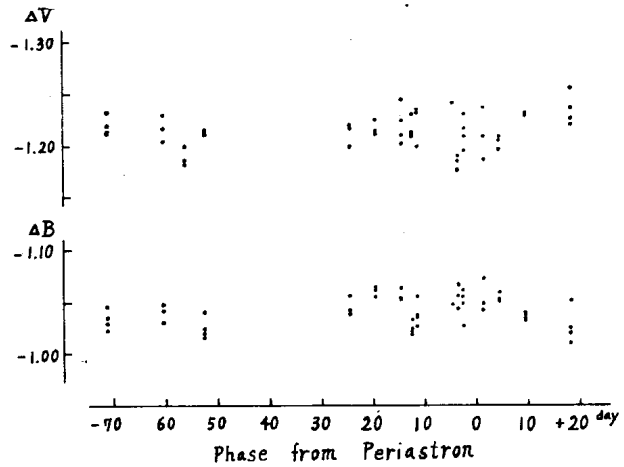
Correcting for differential axtinction, the differential BV standard magnitudes between β Arietis and the comparison were deduced as shown in the following table. In the table, the phases are calculated from periastron with Petrie's elements (1938):

$$\text{Hel JD } 2428010.944 + 106^d.9973\ E.$$

The standard error of a single differential observation can be estimated from differential brightnesses out of periastron to be $0^m.02 \sim 0^m.03$ for both colours. Unfortunately, owing to unfavourable weather condition, no observation was attained on the night nearest periastron. However, even though we consider such amount of accidental errors of observations, it does not seem that β Arietis has any appreciable light variation of more than $0^m.02$ around the periastron, in agreement with the previous conclusion by Lovell and Hall.

I would like to express my hearty thanks to Prof.M. Kitamura at Tokyo Astronomical Observatory for his suggestion of this programme and kind guidance. Thanks are also due to Dr.J. Dommanget at the Royal Observatory of Belgium for his kind information.

Hel JD 2441000+	ΔV	ΔB	phase	Hel JD 2441000+	ΔV	ΔB	phase
635.0838	-1.215	-1.045	-71.515	694.9140	-1.198	-1.053	-11.684
.0879	1.213	1.022	.511	.9175	1.231	1.035	.681
.0928	1.220	1.030	.506	.9203	1.199	1.037	.678
.0984	1.232	1.034	.500	.9240	1.233	1.026	.674
646.0202	1.229	1.042	-60.578	701.8717	1.225	1.068	-4.727
.0243	1.217	1.048	.574	702.9390	1.175	1.067	-4.659
.0285	1.203	1.030	.570	.9421	1.189	1.043	.656
649.9983	1.182	-	-56.600	.9494	1.174	1.066	.649
650.0021	1.186	-	.596	.9608	1.184	1.056	.638
.0066	1.199	-	.592	703.8891	1.194	1.054	-2.709
653.9441	1.215	1.024	-52.654	.8919	1.208	1.048	.707
.9476	1.213	1.020	.651	.8953	1.216	1.027	.703
.9510	1.212	1.016	.647	.8985	1.229	1.061	.700
.9663	1.199	1.061	.632	707.8992	1.187	1.042	+1.301
681.9059	1.219	1.055	-24.693	.9288	1.235	1.072	.330
.9100	1.217	1.042	.688	.9316	1.207	1.047	.333
.9142	1.199	1.038	.684	710.9052	1.197	1.052	+4.307
686.9086	1.224	1.061	-19.690	.9079	1.209	1.053	.310
.9148	1.213	1.063	.684	.9107	1.196	1.058	.312
.9207	1.200	1.072	.678	.9132	1.205	1.051	.315
691.9091	1.202	1.052	-14.689	715.8878	1.229	1.034	+9.289
.9137	1.210	1.063	.685	.8906	1.229	1.037	.292
.9182	1.223	1.064	.680	.8933	1.228	1.039	.295
.9241	1.244	1.051	.674	.8968	1.231	1.031	.298
693.9054	1.209	1.020	-12.693	724.8906	1.256	1.010	+18.292
.9102	1.212	1.017	.688	.8940	1.227	1.019	.296
.9141	1.208	1.023	.684	.8975	1.221	1.024	.299
.9179	1.229	1.032	.681	.9010	1.236	1.050	.303



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