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BLAZHKO EFFECT IN THE RR LYRAE TYPE STAR WY DRACONIS

The RR Lyrae type variable star, WY Draconis, little studied before, was observed photographically at the University Observatory of Cluj (by a Newton telescope of D=50 cm and F=250 cm) during the period 15. October 1959 - 9. October 1970. The investigation was proposed by Prof. W. Tsessevich. 36 maxima were obtained, giving the new elements of the star:

$$\text{Max. hel.} = \text{JD } 2430786{,}5302 \pm 512 + 0^{d}.5889466 \pm 21\ E \qquad (1)$$

Observed maxima as well as the O-C differences given in the table prove a periodic variation of the period which could not be determined with certainty because of the sporadic observations. The observations gave evidence of a large variation in the height of maxima (about $0^{m}.6$) as well as a remarkable variation in the shape of the light curve. The light curves (Fig.1) corresponding to JD 2439269 (ψ = 0.056) and JD 2439786 (ψ = 0.900) illustrate this variation. The brightness of 27 light maxima (m_{max}) and of 13 minima was determined with an accuracy of a few hundredths of magnitude. The period of variation in the height of the maxima was determined as : $P_1 = 24.2823 \times P_o = 14^{d}.301$. The time of maxima can be given by the formula :

$$E = -4955 + 24.2823\,(n+\psi) \qquad (2)$$

where the epoch E corresponds to the elements (1) , n is the number of secondary cycles, taken from the initial epoch E_o=-4955, and ψ is the secondary phase taken as a fraction of the basic period $P_o = 0^{d}.5889466$.

Values of m_{max} are plotted against the phase ψ in Fig.2 showing, with some deviations, the periodicity of the variation of the light curve.

A more accurate study of this phenomenon using more observations is hoped in the future.

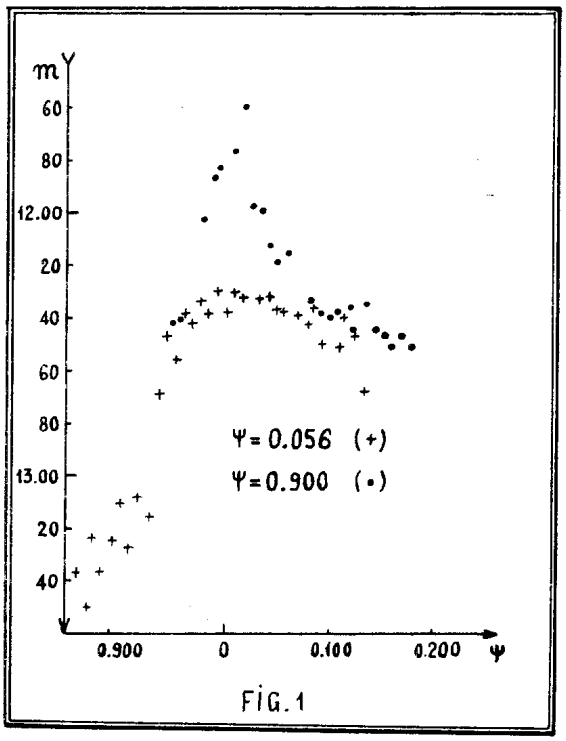
m
60
80
12.00
20
40
60
80
13.00
20
40
Ψ= 0.056 (+)
Ψ= 0.900 (•)
0.900
0
0.100
0.200
Ψ

FIG.1

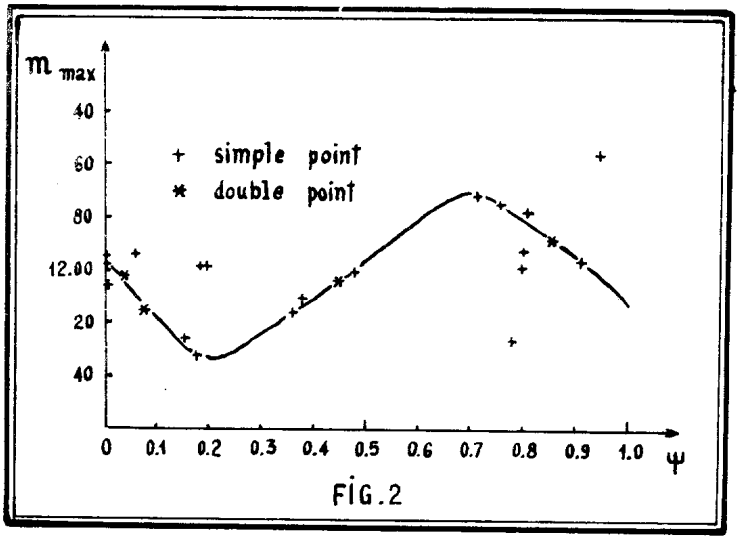
m max
40
60
80
12.00
20
40
+ simple point
* double point
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
Ψ

FIG.2

Max.hel. JD 24...	O-C	n	ψ	m_{max}	m_{min}	
36868.3040	+0.0042	0	0	11.94	13.62	Gh. Chiş
36869.4610	-0.0167	0	0.0809	12.04	13.42	"
36895.4038	+0.0125	1	0.8050	12.01	-	"
36898.3440	+0.0079	2	0.1006	-	-	"
38624.5415	+0.0030	122	0.8052	11.77	-	I. Mihoc
38637.4980	+0.0026	123	0.7112	11.71	13.74	"
38697.5670	-0.0009	127	0.9115	11.95	13.61	"
38729.3680	-0.0037	130	0.1353	-	-	"
38938.4500	+0.0030	144	0.7553	11.74	-	"
38948.4600	+0.0008	145	0.4476	-	-	"
39200.5217	-0.0063	163	0.0807	11.95	13.72	D. Chiş
39230.5610	-0.0036	165	0.1812	12.32	-	"
39269.4358	+0.0007	167	0.8995	11.76	-	"
39285.3370	+0.0004	169	0.0115	-	-	"
39339.5250	+0.0053	172	0.8006	11.92	-	"
39716.4390	-0.0065	199	0.1564	12.25	13.58	"
39719.3925	+0.0022	199	0.3629	12.15	-	"
39720.5637	-0.0045	199	0.4447	-	-	"
39766.5090	+0.0030	202	0.6568	-	-	"
39770.6275	-0.0011	202	0.9455	11.55	13.65	"
39778.2947	+0.0098	203	0.4816	12.00	13.70	"
39786.5302	0.0000	204	0.0575	12.30	13.67	"
39791.2600	+0.0183	204	0.3882	11.78	-	"
39801.2540	+0.0002	205	0.0171	-	-	"
40014.4550	+0.0025	220	0.0581	11.93	13.64	"
40034.4860	+0.0093	221	0.0043	12.10	13.52	"
40093.3730	+0.0016	225	0.0031	11.97	-	"
40104.5775	+0.0161	226	0.2970	-	-	"
40663.4830	+0.0113	265	0.3786	12.10	-	"
40683.4885	-0.0074	266	0.7775	12.26	-	"
40732.3770	-0.0014	270	0.1960	11.98	-	"
40789.5070	+0.0008	274	0.1908	11.98	-	"
40812.4671	-0.0080	275	0.7963	11.98	-	"
40822.5000	+0.0127	276	0.4979	12.30	13.48	"
40858.4390	+0.0260	279	0.0101	12.04	13.44	"
40869.6110	+0.0081	279	0.0102	-	-	"

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