

TYC 717 1091 1, a New Double-Mode RR Lyrae Variable Star, Pulsating in the First and Second Overtone Modes

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Star Name:	TYC 717 1091 1, ASAS 060623+0803.8		
Coordinates (J2000):	06 06 23.08, +08 03 48.7		
Variability type:	RR(B);	Limits, System:	10.95 - 11.5 (V);
Period:	(see Remarks) d;	Epoch:	JD (see Remarks)

Remarks:

The variability of TYC 717 1091 1 = ASAS 060623+0803.8 was reported by Pojmański (2002). ASAS 060623+0803.8 was listed in the ASAS catalog of variable stars as a MISC/RRC variable star with the period 1.000000 d. In 2006, M. Koppelman (http://www.aavso.org/vsx/index.php?view=detail_top&oid=78946 and <http://www.aavso.org/vsx/docs/78946/44/GSC717-1091.jpg>) found the RRC nature of its variability with a period of 0.33225 days.

I re-analysed the ASAS-3 data using the period-search software developed by Dr. V.P. Goranskij for Windows environment. I find that TYC 717 1091 1 is actually an RR Lyrae variable star, pulsating in the first and second overtone modes (an extension of the GCVS RR(B) type, which is defined as fundamental-mode and first-overtone pulsators). The phased light curves plotted for the tabulated elements are shown in the Figure.

Mode	Frequency, c/d	Semi-amplitude, V mag	Period, day	Epoch, JD
f_1	3.010758	0.190	0.3321423	2453706.641
f_2	3.767927	0.024	0.2653979	2453706.651
$2f_2$	7.535829	0.012	0.1326994	2453706.632
$2f_1$	6.020361	0.011	0.1661030	2453706.635
f_1+f_2	6.778710	0.010	0.1475207	2453706.647

The period ratio $P_2/P_1 = 0.7990$ is typical of double-mode variables pulsating in the first and second overtone modes. The tabulated coordinates of the variable were drawn from the Tycho2 catalog. $B-V = 0.554$ (Tycho2), $J-H = 0.197$ (2MASS).

References:

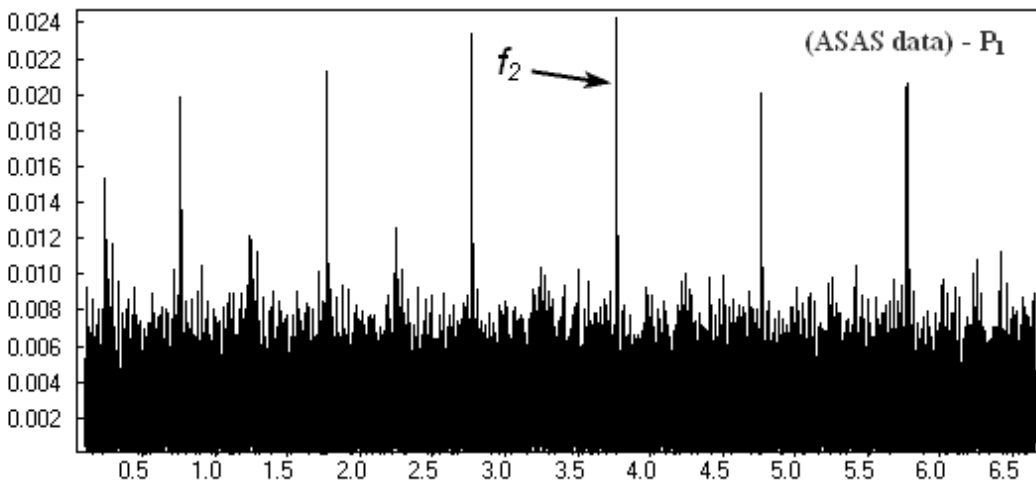
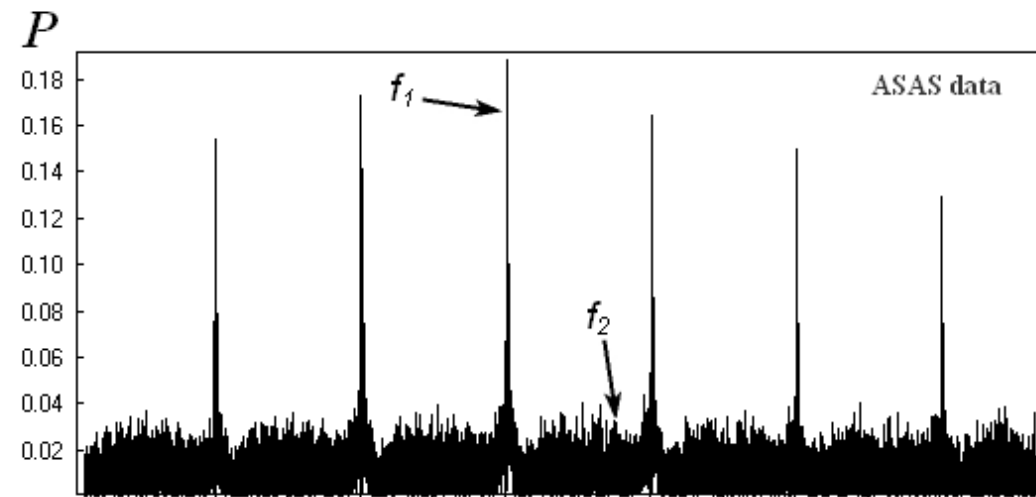
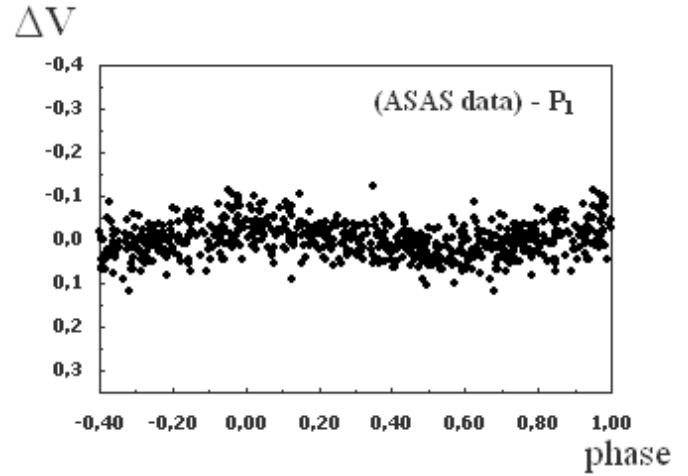
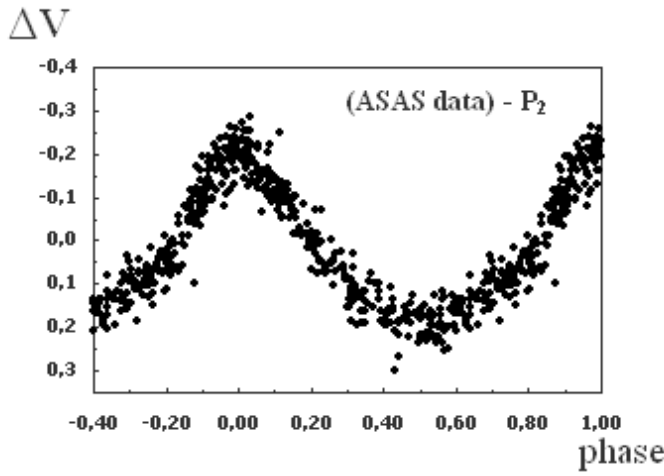
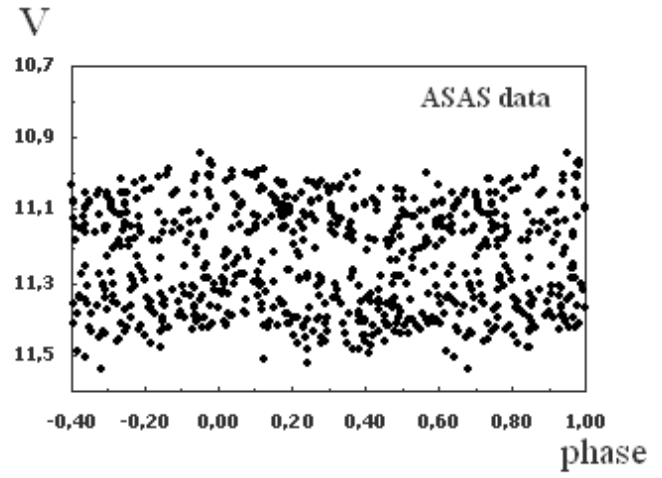
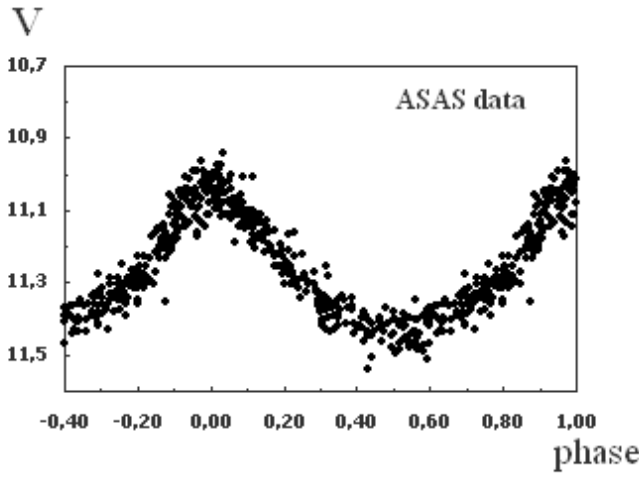
Pojmański, G., 2002, Acta Astron., 52, 397

Light Curve

TYC 717 1091 1 = ASAS 060623+0803.8
RR(B)

First overtone mode, $P_1=0^d.3321423$

Second overtone mode, $P_2=0^d.2653979$



frequency, c/d