

# Variable Star Bulletin

## New Times of Minima of Algol type Systems XZ And, AB Cas and $\beta$ Per

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Photometric observations of three Algol type systems XZ And, AB Cas and  $\beta$  Per were performed at the Akazawa Funao Observatory from December 2014 to November 2019. The instruments of observations are listed in Table 1. The color filters similar to the standard Johnson-Kron-Cousins system were used. We obtained 10 primary and 12 secondary minima during observations almost 80 nights. The results of photometric observations at minima are reported here. The key information are summarized in Table 2. The  $E$  and  $O - C$  values were calculated from the ephemeris of the GCVS 5.1.

Table 1: Telescopes and instruments

Star	Obs. Date	Telescope cm	Camera/Detector	Filter
XZ And	2014/12/02-2015/01/31 2015/08/22-10/12	20	SBIG ST9-XE	$R_c$
AB Cas	2016/11/25-12/23 2017/10/25-26 2018/11/01-04 2018/11/04-10 2019/07/27-08/08 2019/11/06-12	20 28 20 28 28 25	SBIG ST-402ME Moravian G2-1600 SBIG ST9-XE SBIG ST9-XE Moravian G2-1600 SBIG ST9-XE	$V$ $V$ $R_c$ $R_c$ $V$ $V$
$\beta$ Per	2017/02/14-03/17	8	SBIG ST9-XE	$V$

Table 2: Estimated times of the observed minima

Star	Min (HJD 2450000+)	Type	Filter	$E$	$O - C$	Comp. GSC	Check GSC
XZ And	6997.90738(9)	II	$Rc$	3313.5	-0.04926	2824-1676	2824-1378
	7004.01403(6)	I	$Rc$	3318	-0.05050		
	7010.12383(9)	II	$Rc$	3322.5	-0.04859		
	7012.15821(6)	I	$Rc$	3324	-0.05017		
	7018.94435(6)	I	$Rc$	3329	-0.05058		
	7020.9827(2)	II	$Rc$	3330.5	-0.0482		
	7023.01719(6)	I	$Rc$	3332	-0.04966		
	7025.0535(2)	II	$Rc$	3333.5	-0.0493		
	7257.1529(2)	II	$Rc$	3504.5	-0.0498		
	7270.04290(6)	I	$Rc$	3514	-0.05421		
	7276.1525(4)	II	$Rc$	3518.5	-0.0525		
	7280.2215(3)	II	$Rc$	3521.5	-0.0554		
	7299.2203(1)	II	$Rc$	3535.5	-0.0590		
	AB Cas	7718.0813(4)	II	$V$	860.5		
7729.0171(3)		II	$V$	868.5	-0.0067		
7746.10948(7)		I	$V$	881	-0.00046		
8052.29126(6)		I	$V$	1105	-0.00251		
8428.1847(1)		I	$Rc$	1380	-0.0044		
8430.2354(3)		II	$Rc$	1381.5	-0.0040		
8432.28572(7)		I	$Rc$	1383	-0.00405		
8432.9666(3)		II	$Rc$	1383.5	-0.0066		
$\beta$ Per	7799.0175(2)	I	$V$	4240	+0.1337	2851-2169	2851-0511

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