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NEW OBSERVATIONS OF THE PULSATING DA WHITE DWARF G117-B15A

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G117-B15A is a well observed pulsating DA White Dwarf or ZZ Ceti type star. It has 6 pulsation modes (Kepler et al., 1982) where the dominant mode has a period of 215.2s. In this paper we present the data of two nights of observation obtained during a one week observing run at the Konkoly Observatory in February 2002.
Our primary goal is to assist the derivation of the rate of change of the main pulsation period of the star, in particular to assist the work done by Kepler et al. over the past 20 years. Therefore we will present new light curves and the Fourier spectra of the star and the epochs of the light maxima.

We observed G117-B15A for two nights on the 1m-reflector of the Konkoly Observatory mountain station at Piszkéstető, Hungary. The telescope has a focal length of 13.5m and is equipped with a 1024×1024 Thomson TH7896M CCD chip, which has its maximum sensitivity in the visual band. In order to collect as much light as possible, no filter was used. Furthermore only a small area on the CCD frame was used to minimize the integration time. We collected 16 hours of data for our target.

RA (Eq. 2000):	$9^h24^m16^s$
Dec. (Eq. 2000):	$35°16'.9$
Spectral Type:	DAV (ZZ Ceti)
Magnitude (V):	15.54

Table 1: Coordinates, Spectral Type and Magnitude of G117-B15A

We used the IRAF package for image-processing and photometry. Two stars on the same frame were used as comparison stars (GSC2.2 N23332237260 and N2333223509). The significance level, shown in Figure 2, is based on an amplitude signal/noise ratio of ~ 4.0, which was proposed as a criterion to distinguish between pulsation and noise by Breger et al. (1993).

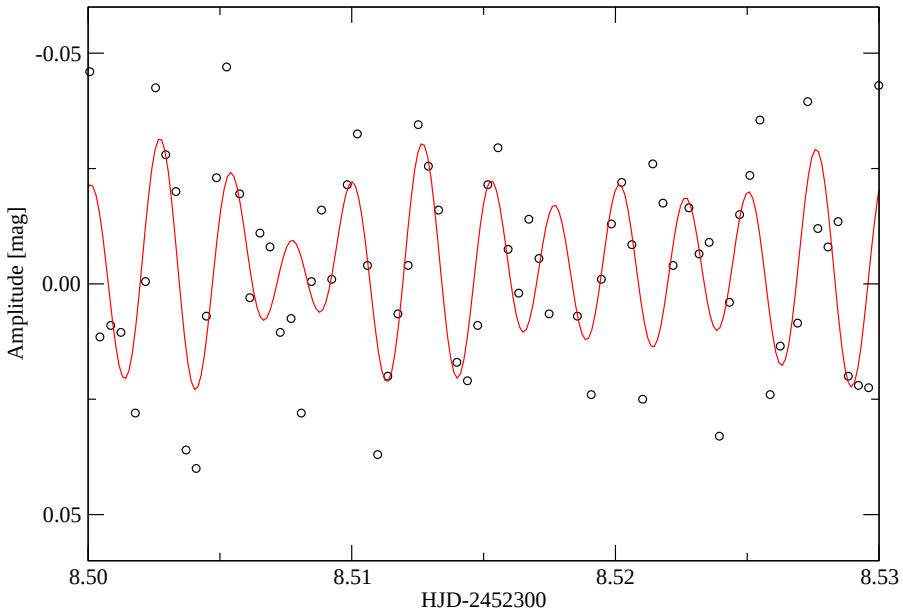

Figure 1. Part of the light curve of G117-B15A. Since the periods are short in respect to the amount of data, we chose a narrow region of the light curve for this presentation. The fitted curve represents the composite of the three detected frequencies.

During the two nights of observation 3 of the 6 previously detected frequencies (Kepler et al., 1982) could be derived. The values for the frequencies, amplitudes and phases are listed in Table 2. We also quote the values derived by Kepler et al. for comparison reasons.

Mode	Frequency	Amplitude	Epoch of maximum light	Frequencies and Amplitudes derived by Kepler et al. (1982)	
	mHz	mmag	HJD	mHz	mmag
		±0.86	245 2307+	±0.005	
f1	4.65	17.45	.498979	4.645	22.0
f2	3.29	6.17	.499047	3.285	7.5
f3	3.71	5.61	.497840	3.690	6.7
f4				9.295	1.6
f5				8.345	1.3
f6				7.925	1.4

Table 2: Table of derived frequencies, amplitudes and epoch of maximum light. We use the techniques of Breger et al. (1999) to derive the uncertainties in amplitude and epoch of maximum light. We assume therefore that the errors of the data points are not correlated in time.

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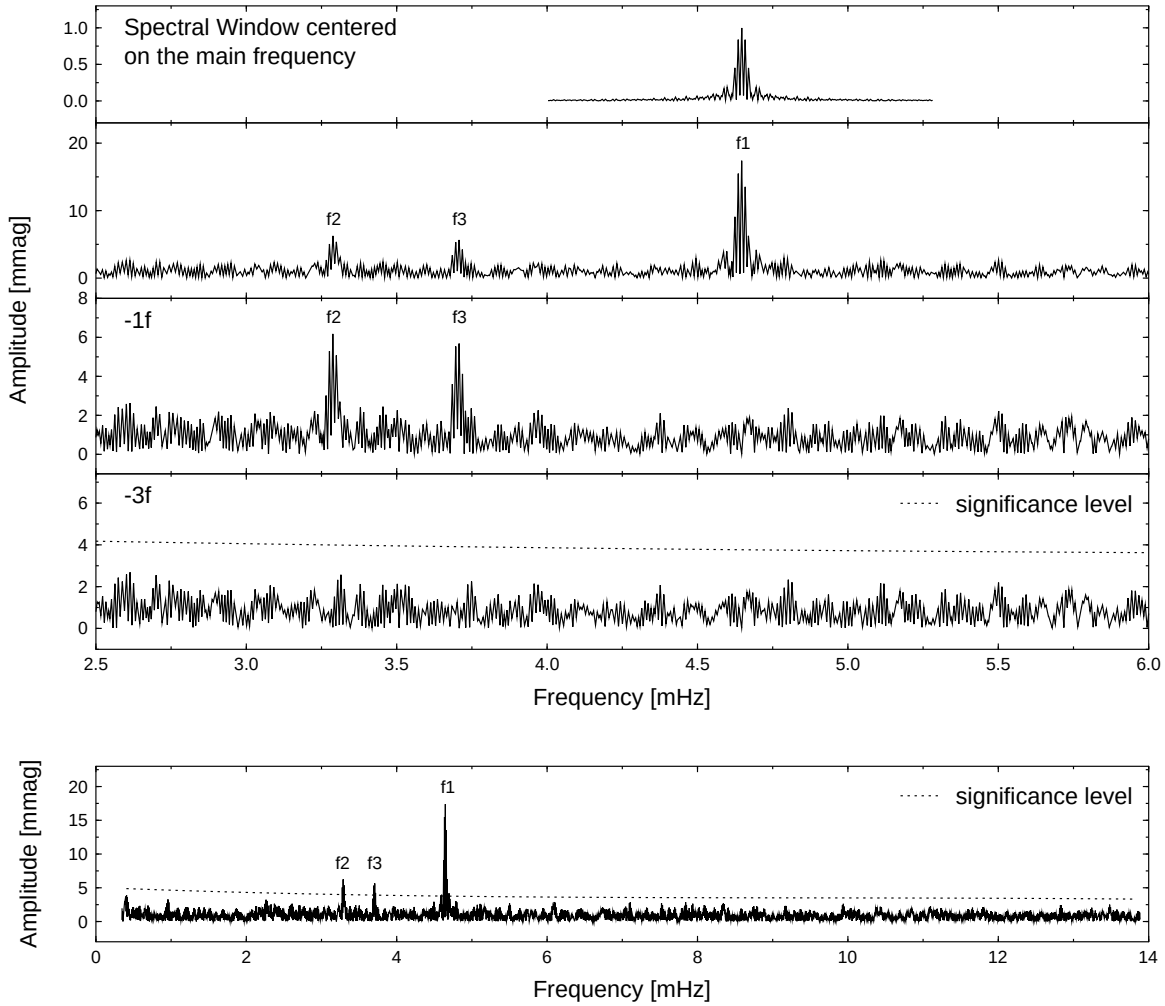

Figure 2. Amplitude spectrum of G117-B15A derived from Fourier analysis with the Period98 package (Sperl, 1998). Three of the six previously detected frequencies could be resolved. We show only a part of the spectra in the upper half of the figure to be able to resolve the spectral window completely.

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