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Second Version of SpectraView for Spectra Analysis

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Abstract: *This short communication presents a second version of the program SpectraView (SV2). The Second Version of SpectraView for Spectra Analysis is based on data collected with 2-m RCC telescope at Rozhen National Astronomical Observatory. This version is equipped with new user interface and other features unavailable in its previous versions. It has also been created using modern programming language and is now compatible with the latest operating systems. The program has been tested on the observations of the five short-period variable stars.*

Keywords: *Variable stars, Spectra, Programs*

Introduction

The short communication presents a new version of the program for 2D visualization of star spectra obtained in Rozhen National Astronomical Observatory. The aim is to convert one-dimensional arrays into two-dimensional images with the possibility of adjusting the degree of gray (gray scale). This allows us to visualize the curves of the radial velocities and to determine their half-amplitudes even more precisely. As it is well known in astronomy, spectral observations are the only source of information for the masses of the stars. The program, object of the present work, aims to facilitate the analysis of the obtained radial velocity curves. The program has been tested on the observations of the stars NSVS 254037, TYC3621-711, ASAS J102556+2049,3, NSVS 2569022 and NSVS781878.

Discussion

The first two stars, that have been test objects of the initial version of the program [1], are presented with inverted graphics in Figure 1 and Figure 2. The following analysis of the RV curves and the numerical modeling of these stars were published by Kjurkchieva et al. [2]. This and the possibility to export the final images in different file formats are new functions of the program. Figures 3 and 4 show the converted images for the third and fourth stars respectively, Figure 5 show rasterized pictures format for the five stars. Unfortunately, due to the limitations of the MATLAB version that we used; we were unable to make an EXE file version of the program. Source code and help file can be found at: <http://astro.shu-bg.net/spectraview.zip>. We are going to move to a newer version of the MATLAB program (R2016a), that allows us to achieve more functionality and better program interface. With the new version we are going to achieve much better visualization of the fitting procedures using the code of Snyder, L.F. [3]. The white lines in Figure 4 and Figure 5 represent the fits of the RV curves. The parameters of these fits are shown in Table 1.

Table 1. Results from the fitting procedure for the two stars

Parameter	ASAS J102556	NSVS781878
$V_1 \sin i$	140.12 ± 4.82 [km/s]	90.99 ± 3.96 [km/s]
$V_2 \sin i$	284.16 ± 6.73 [km/s]	194.24 ± 8.00 [km/s]
Q	0.4929	0.4684
Average γ	-29.28 ± 7.31 [km/s]	-35.50 ± 8.30 [km/s]
Correlation coefficient 1	-0.975926	-0.952070
Correlation coefficient 2	0.952815	0.960294

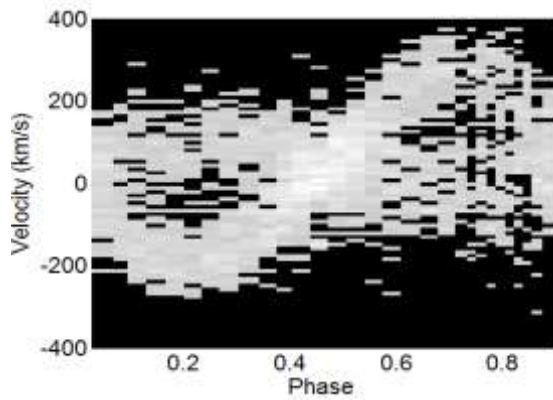


Figure 1. The star NSVS 254037 (negative conversion)

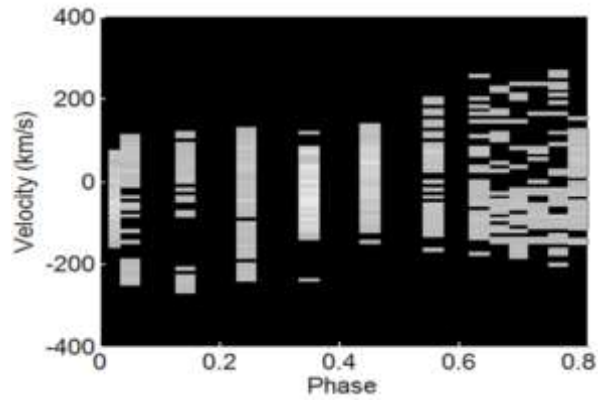


Figure 2. The star TYC3621-711

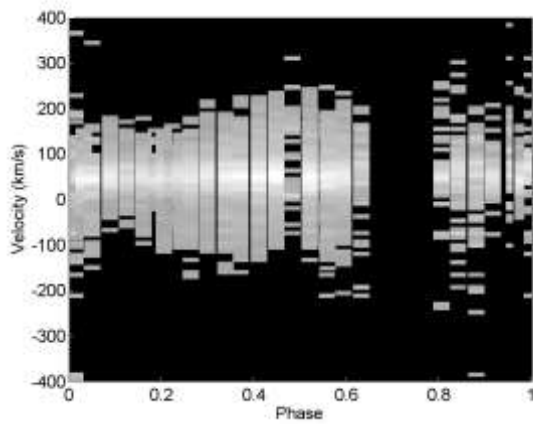


Figure 3. The star NSVS 2569022 (negative conversion)

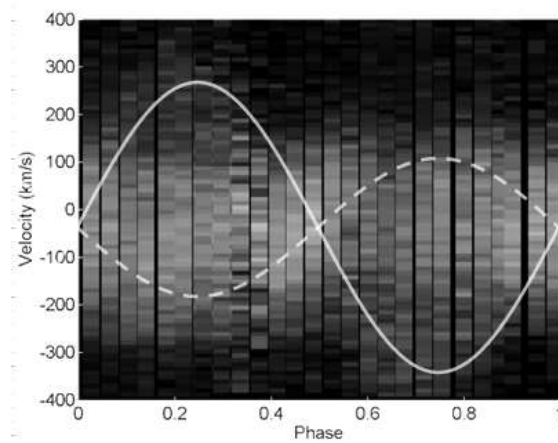


Figure 4. The star ASAS J102556

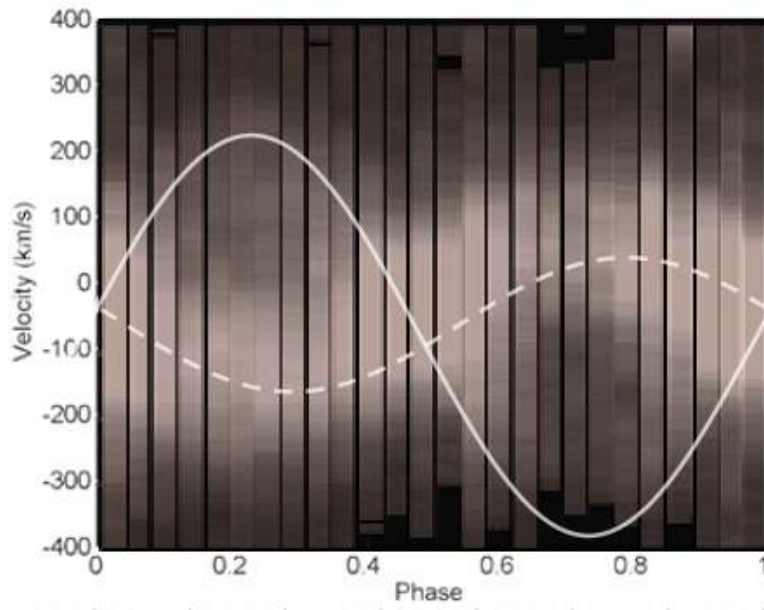


Figure 5. The star NSVS781878

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