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HD 62454 – A NEW SPECTROSCOPIC BINARY

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HD 62454 is a new addition to the “Master List” of γ Doradus-type Variables (Handler & Krisciunas 1997). This star was first recognized by Henry (1996) as a low-amplitude variable after it was chosen as a comparison star for high-precision photometry of solar-type stars with the SAO / TSU 0.75 m automatic photoelectric telescope (Henry 1995) and preliminary data were presented by Kaye et al. (1998).

Thirty-three high signal-to-noise ratio spectra were obtained over eleven nights at the Kitt Peak National Observatory during late November and early December of 1997. These spectra were taken simultaneously with photometry obtained at both Washington Camp, Arizona and Sierra Nevada, Spain (Kaye 1998). The signal-to-noise ratio (SNR) is estimated to be approximately 275. Each spectrum covers the wavelength region 4403 to 4617 Ångströms and were obtained using grating A, camera 5, and the long collimator. Filter 4-96 was used to block both higher and lower orders. Data were recorded on the F3KB CCD (3000 \times 1000 pixels, 15 \times 15 μ m pixel size, 75% detector quantum efficiency (DQE) at 4210 Ångströms); these spectra have a reciprocal dispersion of 0.070 Ångströms per pixel (4.643 Ångströms per millimeter), resulting in a resolving power of approximately 34,400. The slit width was fixed at 250 μ m, which corresponds to 1.81 seconds of arc. The projected slit image was 0.027 mm and covered 1.77 pixels.

Subsequent analysis based on the the time series of first moments of the Fe II λ 4508.289 photospheric line indicates that HD 62454 is a spectroscopic binary. Table 1 lists the measured radial velocities (plotted in Figure 1), and Table 2 presents the preliminary orbital elements of the system. The standard deviation of the orbital fit (noted as σ in Table 2) is higher than expected due to the ongoing pulsations present in HD 62454a.

A complete photometric analysis and a preliminary spectroscopic analysis (using the method of moments as related to the “ γ Doradus phenomenon”) are presented in Kaye (1998).

Table 1. Radial Velocities of HD 62454a

HJD-2450700	V_r
77.9570	54.4103
77.9784	54.8054
78.8511	52.0470
78.8726	51.1388
78.9613	49.9706
78.9827	49.7631
80.7640	29.3740
80.7852	28.9516
80.8063	29.0373
80.8790	27.6276
80.9002	27.2981
80.9214	26.9832
81.7426	11.2322
81.7903	10.0462
81.8850	8.6168
81.9515	7.6767
81.9982	6.6965
82.7728	-6.4372
82.9963	-9.5304
85.8779	-42.5398
85.8990	-42.0260
85.9202	-41.9840
86.0076	-41.8618
86.0287	-42.1527
86.8909	-23.2998
86.9121	-22.8126
86.9783	-22.4151
87.0341	-20.0233
87.7519	9.1827
87.8523	15.0026
87.8734	16.0439
87.9550	20.2169
87.9762	20.6628

Table 2. Preliminary Orbital Elements of HD 62454a

Orbital Element	Value
γ	$10.87 \pm 0.10 \text{ km s}^{-1}$
K_1	$50.79 \pm 0.17 \text{ km s}^{-1}$
e	0.166 ± 0.002
Ω	179.45 ± 0.011
$T_0 - 2450700$	70.87 ± 0.04
P	$14.02 \pm 0.02 \text{ days}$
mass function	0.183 ± 0.002
σ	5.62 km s^{-1}

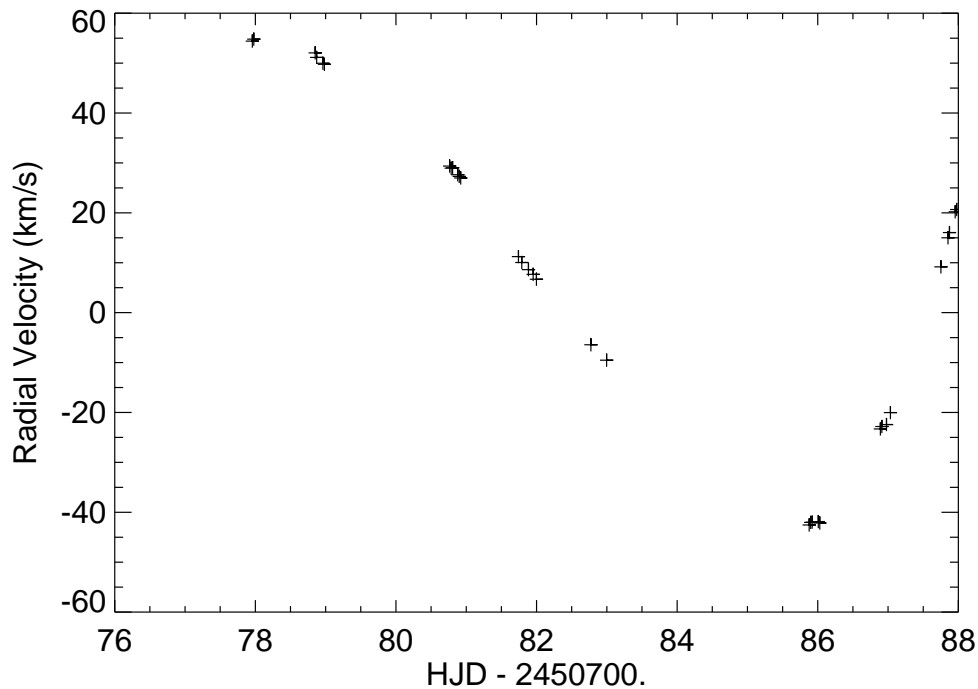


Figure 1. A radial velocity curve of the primary star (HD 62454a) based on the first moments of the Fe II λ 4508.289 line

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ERRATUM

When checking the data published in the IBVS No. 4543 issue for updating and supplementing the variable star catalogs, several incorrect and confusing statements have been found.

The last sentence of the first paragraph should read as follows:

Object 4 is NGC 13386 (Wisniewski and Coyne, 1976, hereafter WC) and object 13 is NSV 13792 (Geyer and Giesecking, 1975, hereafter GG).

In Table 1, Note 2 should be in the SAME line with Note 1 (both belong to NSV 13792).

On page 2, the contents of Note 5 and Note 2 are interchanged.

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