

SPECTROSCOPIC AND PHOTOMETRIC INVESTIGATION OF THE HYADES DWARF VAN BUEREN 62

G. A. Bakos

Department of Physics, University of Waterloo, Waterloo, Ontario,
Canada

J. Tremko

Astronomical Institute, Slovak Academy of Sciences, Skalnaté Ple-
so Observatory, 059 60 Tatranská Lomnica, Czechoslovakia

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ABSTRACT. The orbital elements of this spectroscopic binary derived from spectrographic observations differ slightly from those given by Griffin and Gunn. The system is not likely to be eclipsing, however, a small brightness variation with a period of 1.52 days has been found.

СПЕКТРОСКОПИЧЕСКОЕ И ФОТОМЕТРИЧЕСКОЕ ИССЛЕДОВАНИЕ КАРЛИКА ВАН БУЭРЕН 62 В РАССЕЙНОМ ЗВЕЗДНОМ СКОПЛЕНИИ ГИАДЫ. Спектроскопические элементы полученные из наших наблюдений, незначительно отличаются от элементов, приведенных Гриффином и Гунном. Система вероятно не затменная, но были обнаружены малые изменения яркости с периодом 1.52 дня.

СПЕКТРОСКОПИCKÝ A ФОТОМЕТРИCKÝ VÝSKUM TRPASLÍKA VAN BUEREN 62 V OTVORENEJ HVIEZDKOPE HYÁDY. Dráhové elementy odvodené pre túto spektroskopickú dvojhviezdu zo spektroskopických pozorovaní líšia sa nepatrne od elementov publikovaných Griffinom a Gunnom. Sústava pravdepodobne nie je zákrytovou dvojhviezdou, avšak našli sa malé zmeny jasnosti s periódou 1.52 dňa.

1. INTRODUCTION

The star BD +21^o644 (HD 28033, van Bueren 62) of spectral type F8 V has been known to have a variable radial velocity. It is a member of the Hyades cluster and as such its spectrographic and photometric study may be of interest in further investigations of this cluster. The spectrograms of this star were made available to one of us at the Hamburg Observatory. In addition, in 1967 photometric observations began at the Skalnaté Pleso Observatory in the hope that the star would be an eclipsing binary. Later we continued the photometry at the University of Waterloo Observatory.

In the meantime Griffin and Gunn (1978) published the spectroscopic orbit of van Bueren 62. According to the orbital elements, the period of the star is 8.55 days. Our observations confirm their result.

2. SPECTROGRAPHIC AND PHOTOMETRIC OBSERVATIONS

Twenty nine spectrograms taken with the two-prism spectrograph of the 1-m telescope of the Hamburg Observatory have been measured. The dispersion of the spectra was 7nm/mm. The quality of the material was variable since many plates were underexposed. The reduction of the spectrograms and the derivation of radial velocities followed the standard procedures. The data and the results have been compiled in Table 1, which contains following information: the Julian date, the radial velocity, the phase and the residuals O-C, in km/s. The phase was computed using the period of Griffin and Gunn; the zero point was chosen to coincide with the expected primary minimum. The standard deviation of the derived velocities is ± 3.6 km/s.

Table 1

Radial velocity observations of van Bueren 62

J.D. hel	V (km/s)	Phase	O-C (km/s)
2438022.349	+ 51.0	.3346	- 2.1
.377	52.3	.3379	- 0.6
8031.378	49.1	.3905	- 0.8
.410	57.4	.3943	+ 7.8
8040.371	47.3	.4422	+ 1.3
8044.440	38.2	.9181	+ 4.1
.467	29.7	.9212	- 4.6
8046.358	51.3	.1420	- 0.6
.387	53.9	.1458	+ 1.8
8049.230	42.2	.4783	- 0.7
.267	40.9	.4826	- 1.6
8050.322	31.8	.6060	- 0.6

Table 1 (continued)

J.D. hel	V (km/s)	Phase	O-C (km/s)
2438050.351	+ 31.0	.6093	- 1.1
8051.357	27.7	.7270	+ 0.6
.383	29.3	.7300	+ 2.2
8052.236	26.2	.8298	- 2.5
.260	29.2	.8326	+ 0.3
8060.228	30.0	.7644	+ 2.9
8085.276	21.2	.6937	- 6.7
9043.588	28.1	.7654	+ 1.0
9054.565	44.7	.0492	- 0.6
9536.309	58.5	.3877	+ 8.4
9537.285	41.0	.5018	+ 0.2
2440540.510	33.1	.8260	+ 4.5
.562	34.8	.8321	+ 6.0
0559.496	39.7	.0463	- 5.3
.593	44.6	.0577	- 1.4
0560.368	55.5	.1483	+ 3.2
0632.278	30.6	.5580	- 5.4

The photometric observations made at the Skalnaté Pleso Observatory utilized both the standard and the automated photoelectric photometers attached to the 0.6-m telescope, in the visual spectral band. The description of the instruments and the conversion to the standard UBV system have been published elsewhere (Tremko, 1975; Horák et al., 1976). Since no changes of brightness in the course of a few hours were found, the average values of the brightness were computed and listed in Table 2. A mean point may contain about 20 measurements. The Waterloo observations were made with the photometer attached to the 0.3-m telescope. On the average a mean point contains about 10 observations. These have also been listed in Table 2.

Table 2

Photometric observations of van Bueren 62

J.D. hel	V mag	Phase P = 8.5d	Phase P = 1.5d
2439837.435	7.392	.604	.642
9881.345	7.385	.739	.548
2440610.416	7.393	.060	.708
0612.445	7.399	.239	.715
0915.486	7.373	.682	.175
0927.501	7.373	.083	.065
0994.307	7.386	.898	.043
1004.301	7.389	.065	.611
3820.785	7.366	.444	.255

Table 2 (continued)

J.D. hel	V mag	Phase P = 8.5d	Phase P = 1.5d
2443861.634	7.372	.221	.139
3921.596	7.390	.234	.603
3948.528	7.360	.383	.328
3960.527	7.364	.787	.225
4116.863	7.381	.070	.116
4139.849	7.359	.758	.244
4156.858	7.367	.755	.438
4189.750	7.383	.593	.086
4242.553	7.397	.769	.838

In the first column is the Julian date followed by the V magnitude and the phase, one corresponding to the period of 8.5 and the other to the period of 1.5 days. The star HD 27524 served as a comparison star; its photoelectric magnitude $V = 6.80$. The standard deviation of the former set of observations is ± 0.002 mag., that of the latter observations is ± 0.005 mag. The individual observations have been listed in Table 3. The layout of the table is obvious.

Table 3

Individual photoelectric observations of van Bueren 62

J.D. hel	V	J.D. hel	V
2439837.3885	7.395	2439837.4088	7.392
.3892	7.381	.4096	7.386
.3901	7.397	.4103	7.388
.3908	7.396	.4110	7.388
.3915	7.390	.4118	7.392
.3923	7.384	.4125	7.391
.3930	7.391	.4131	7.389
.3938	7.391	.4146	7.388
.3947	7.398	.4154	7.386
.3955	7.394	.4190	7.388
.3987	7.392	.4197	7.389
.3998	7.394	.4229	7.397
.4005	7.389	.4237	7.395
.4012	7.395	.4244	7.390
.4019	7.387	.4251	7.390
.4026	7.390	.4258	7.398
.4033	7.384	.4265	7.391
.4041	7.384	.4272	7.392
.4048	7.389	.4281	7.382
.4055	7.391	.4289	7.382

Table 3 (continued)

J.D. hel	V	J.D. hel	V
2439837.4322	7.384	2439837.4754	7.395
.4331	7.384	.4761	7.396
.4339	7.390	.4768	7.398
.4346	7.391		
.4353	7.390	2439881.3112	7.383
.4360	7.386	.3119	7.382
.4368	7.390	.3126	7.391
.4375	7.394	.3134	7.385
.4382	7.389	.3141	7.391
.4389	7.392	.3149	7.395
.4418	7.392	.3228	7.376
.4425	7.392	.3242	7.403
.4432	7.396	.3250	7.402
.4439	7.390	.3257	7.381
.4447	7.399	.3265	7.359
.4454	7.392	.3270	7.379
.4461	7.391	.3275	7.388
.4469	7.395	.3287	7.398
.4476	7.396	.3294	7.387
.4483	7.396	.3362	7.364
.4515	7.399	.3369	7.374
.4523	7.397	.3376	7.376
.4530	7.389	.3385	7.369
.4538	7.398	.3397	7.391
.4544	7.399	.3445	7.380
.4552	7.386	.3452	7.383
.4559	7.395	.3460	7.375
.4566	7.395	.3468	7.374
.4574	7.398	.3475	7.370
.4582	7.396	.3520	7.394
.4610	7.395	.3528	7.391
.4631	7.404	.3535	7.385
.4638	7.399	.3545	7.375
.4645	7.402	.3698	7.390
.4653	7.397	.3709	7.377
.4660	7.399	.3714	7.380
.4667	7.403	.3721	7.380
.4674	7.393	.3729	7.393
.4700	7.391	.3735	7.393
.4710	7.395	.3750	7.362
.4717	7.388	.3757	7.377
.4725	7.394	.3764	7.381
.4732	7.388	.3772	7.384
.4747	7.396	.3843	7.380

Table 3 (continued)

J.D. hel	V	J.D. hel	V
2439881.3851	7.369	2440610.4189	7.396
.3857	7.376	.4197	7.395
.3864	7.374	.4225	7.389
.3872	7.378	.4237	7.395
.3879	7.383	.4247	7.393
.3887	7.370	.4257	7.382
.3973	7.390	.4263	7.396
.3980	7.392	.4270	7.381
.3987	7.389	.4277	7.386
.3995	7.400	.4284	7.385
.4002	7.396	.4289	7.390
.4009	7.406	.4300	7.391
.4017	7.394	.4308	7.387
.4024	7.401	.4315	7.390
.4031	7.387	.4323	7.390
.4039	7.388		
.4098	7.399	2440612.4285	7.392
.4105	7.390	.4292	7.391
.4112	7.390	.4299	7.401
.4119	7.395	.4306	7.395
.4127	7.386	.4313	7.401
.4134	7.391	.4320	7.403
.4142	7.381	.4327	7.406
.4149	7.383	.4334	7.408
.4156	7.374	.4341	7.405
.4164	7.376	.4348	7.408
		.4355	7.417
2440610.4031	7.400	.4362	7.417
.4037	7.403	.4369	7.413
.4044	7.402	.4409	7.416
.4051	7.398	.4416	7.406
.4058	7.399	.4423	7.407
.4068	7.393	.4431	7.411
.4075	7.394	.4438	7.410
.4082	7.388	.4445	7.407
.4091	7.395	.4452	7.407
.4099	7.392	.4459	7.407
.4127	7.388	.4466	7.412
.4136	7.397	.4472	7.416
.4144	7.401	.4500	7.402
.4151	7.390	.4507	7.401
.4160	7.397	.4514	7.392
.4168	7.394	.4521	7.392
.4176	7.400	.4529	7.394

Table 3 (continued)

J.D. heI	V	J.D. heI	V
2440612.4535	7.397	2440915.2645	7.381
.4542	7.395	.2651	7.379
.4549	7.389	.2659	7.388
.4556	7.383	.2665	7.385
.4563	7.380	.2672	7.385
.4570	7.378	.2680	7.380
.4577	7.381	.2686	7.381
.4605	7.375	.2707	7.388
.4612	7.375	.2714	7.385
.4619	7.372	.2722	7.387
.4626	7.383	.2728	7.377
.4632	7.382	.2735	7.363
.4639	7.385	.2748	7.374
.4646	7.393	.2755	7.378
.4653	7.394	.2762	7.383
.4660	7.401	.2770	7.372
.4667	7.408	.2790	7.362
.4674	7.392	.2797	7.367
.4681	7.407	.2803	7.376
.4721	7.402	.2810	7.379
.4728	7.401	.2817	7.377
.4736	7.394	.2825	7.377
.4746	7.397	.2832	7.366
.4750	7.401	.2839	7.359
.4758	7.407	.2845	7.351
.4765	7.411	.2852	7.348
.4772	7.405	.2873	7.378
.4779	7.401	.2880	7.381
.4785	7.406	.2887	7.378
.4812	7.402	.2894	7.379
.4819	7.407	.2901	7.366
.4826	7.401	.2908	7.365
.4833	7.402	.2915	7.368
.4840	7.398	.2929	7.354
.4850	7.396	.2936	7.368
.4861	7.396	.2957	7.368
.4869	7.396	.2964	7.369
.4876	7.391	.2972	7.366
.4883	7.398	.2979	7.371
.4890	7.386	.2985	7.364
		.2992	7.355
2440915.2623	7.380	.2999	7.359
.2630	7.380	.3000	7.363
.2638	7.379	.3012	7.364

Table 3 (continued)

J.D. hel	V	J.D. hel	V
2440915.3019	7.361	2440915.5241	7.372
.3042	7.357	.5262	7.369
.3048	7.362	.5269	7.366
.3054	7.362	.5275	7.367
.4752	7.363	.5283	7.372
.4759	7.364	.5289	7.367
.4767	7.363	.5296	7.373
.4773	7.365	.5302	7.370
.4780	7.370	.5309	7.372
.4787	7.370	.5317	7.372
.4794	7.373	.5323	7.371
.4801	7.377	.5350	7.367
.4807	7.374	.5357	7.367
.4814	7.370	.5364	7.366
.4835	7.369	.5371	7.366
.4841	7.369	.5378	7.368
.4849	7.371	.5385	7.366
.4855	7.369	.5392	7.362
.4862	7.374	.5399	7.369
.4869	7.374	.5406	7.370
.4876	7.364	.5413	7.369
.4883	7.364	.6318	7.380
.4890	7.356	.6323	7.380
.4897	7.361	.6331	7.381
.5088	7.368	.6338	7.384
.5096	7.380	.6344	7.384
.5103	7.386	.6352	7.384
.5110	7.378	.6359	7.382
.5117	7.381	.6366	7.377
.5123	7.381	.6372	7.378
.5131	7.386	.6379	7.379
.5137	7.377	.6386	7.382
.5144	7.377	.6393	7.377
.5151	7.378	.6400	7.384
.5158	7.375	.6407	7.379
.5178	7.369	.6414	7.380
.5185	7.369	.6435	7.381
.5193	7.368	.6448	7.377
.5199	7.376	.6456	7.375
.5206	7.372	.6463	7.376
.5214	7.377	.6470	7.374
.5221	7.373	.6477	7.377
.5227	7.369	.6483	7.379
.5234	7.372	.6490	7.374

Table 3 (continued)

J.D. hel	V	J.D. hel	V
2440915.6497	7.381	2440927.4780	7.374
.6505	7.383	.4788	7.380
.6510	7.388	.4793	7.385
.6517	7.377	.4801	7.376
		.4807	7.385
2440927.4457	7.373	.4845	7.374
.4464	7.363	.4853	7.371
.4471	7.365	.4859	7.368
.4477	7.366	.4867	7.369
.4484	7.362	.4873	7.360
.4491	7.367	.4879	7.374
.4498	7.368	.4887	7.366
.4505	7.366	.4894	7.370
.4512	7.369	.4901	7.380
.4519	7.371	.4908	7.370
.4540	7.381	.4916	7.381
.4547	7.386	.4921	7.385
.4553	7.382	.4927	7.380
.4560	7.381	.4963	7.361
.4567	7.381	.4970	7.367
.4574	7.382	.4977	7.371
.4581	7.395	.4985	7.371
.4588	7.389	.4993	7.376
.4595	7.391	.5000	7.368
.4602	7.391	.5008	7.360
.4608	7.389	.5013	7.379
.4636	7.381	.5018	7.373
.4645	7.382	.5025	7.365
.4650	7.393	.5032	7.375
.4656	7.377	.5039	7.382
.4664	7.378	.5060	7.369
.4671	7.373	.5067	7.349
.4678	7.376	.5074	7.376
.4685	7.376	.5080	7.370
.4692	7.430	.5087	7.366
.4700	7.380	.5094	7.372
.4707	7.380	.5102	7.380
.4729	7.378	.5108	7.372
.4734	7.375	.5116	7.369
.4741	7.370	.5122	7.365
.4748	7.370	.5142	7.376
.4755	7.374	.5149	7.369
.4762	7.379	.5156	7.372
.4769	7.371	.5164	7.372

Table 3 (continued)

J.D. hel	V	J.D. hel	V
2440927.5171	7.368	2440994.2836	7.393
.5178	7.369	.2838	7.394
.5185	7.369	.2841	7.392
.5191	7.370	.2844	7.386
.5198	7.380	.2846	7.387
.5206	7.389	.2890	7.391
.5226	7.376	.2893	7.390
.5233	7.381	.2895	7.395
.5240	7.390	.2898	7.397
.5247	7.371	.2901	7.396
.5254	7.368	.2903	7.405
.5261	7.368	.2905	7.403
.5268	7.363	.2908	7.401
.5275	7.351	.2910	7.399
.5289	7.364	.2912	7.400
.5296	7.368	.2915	7.392
.5303	7.375	.2917	7.393
.5310	7.377	.2919	7.402
		.2922	7.412
2440994.2762	7.379	.2924	7.406
.2765	7.373	.2927	7.394
.2769	7.387	.2929	7.399
.2771	7.380	.2932	7.405
.2774	7.379	.2934	7.407
.2776	7.380	.2936	7.408
.2778	7.385	.2939	7.403
.2781	7.379	.2941	7.412
.2783	7.387	.2944	7.407
.2786	7.382	.2946	7.412
.2788	7.394	.2948	7.414
.2790	7.377	.2951	7.420
.2793	7.386	.2953	7.410
.2795	7.387	.2958	7.414
.2800	7.383	.2961	7.413
.2802	7.395	.2963	7.414
.2814	7.380	.2965	7.412
.2816	7.381	.2968	7.414
.2819	7.375	.2970	7.413
.2821	7.387	.2973	7.418
.2823	7.389	.2976	7.421
.2826	7.387	.2978	7.415
.2829	7.396	.2981	7.424
.2831	7.386	.2983	7.415
.2833	7.387	.3023	7.419

Table 3 (continued)

J.D. hel	V	J.D. hel	V
2440994.3027	7.416	2440994.3185	7.365
.3029	7.420	.3187	7.370
.3033	7.421	.3190	7.378
.3035	7.411	.3192	7.372
.3038	7.397	.3195	7.380
.3040	7.408	.3197	7.374
.3043	7.416	.3200	7.371
.3045	7.424	.3202	7.361
.3047	7.403	.3205	7.370
.3050	7.400	.3207	7.367
.3055	7.404	.3209	7.364
.3057	7.412	.3212	7.362
.3059	7.413	.3214	7.373
.3062	7.399	.3217	7.375
.3064	7.410	.3219	7.368
.3067	7.404	.3221	7.373
.3068	7.407	.3224	7.378
.3072	7.408	.3226	7.364
.3076	7.412	.3229	7.372
.3079	7.399	.3231	7.355
.3081	7.410	.3234	7.374
.3084	7.404	.3236	7.364
.3089	7.397	.3238	7.369
.3091	7.398	.3241	7.377
.3094	7.402	.3243	7.378
.3097	7.396	.3245	7.361
.3099	7.393	.3248	7.377
.3101	7.389	.3250	7.370
.3104	7.394	.3253	7.382
.3106	7.383	.3255	7.379
.3108	7.391	.3258	7.370
.3111	7.392	.3263	7.368
.3113	7.388	.3265	7.365
.3115	7.389	.3268	7.355
.3118	7.382	.3270	7.356
.3162	7.389	.3306	7.356
.3164	7.393	.3309	7.358
.3168	7.369	.3312	7.378
.3171	7.378	.3315	7.361
.3173	7.386	.3317	7.366
.3175	7.369	.3320	7.364
.3177	7.373	.3322	7.410
.3180	7.370	.3325	7.367
.3183	7.372	.3327	7.364

Table 3 (continued)

J.D. hel	V	J.D. hel	V
2440994.3329	7.347	2441004.2682	7.394
.3331	7.355	.2686	7.393
.3334	7.372	.2690	7.390
.3336	7.362	.2693	7.380
.3339	7.360	.2697	7.395
.3341	7.361	.2701	7.390
.3344	7.363	.2705	7.390
.3349	7.362	.2713	7.392
.3351	7.359	.2718	7.390
.3353	7.364	.2722	7.384
.3356	7.366	.2725	7.392
.3361	7.350	.2771	7.383
.3363	7.355	.2774	7.389
.3365	7.349	.2778	7.383
.3368	7.373	.2782	7.383
.3370	7.370	.2785	7.386
.3373	7.353	.2789	7.390
.3375	7.366	.2792	7.380
.3377	7.377	.2796	7.388
.3380	7.358	.2800	7.386
.3383	7.356	.2803	7.386
.3386	7.365	.2807	7.389
.3388	7.366	.2810	7.394
.3393	7.365	.2814	7.384
		.2818	7.389
2441004.2605	7.389	.2822	7.381
.2609	7.390	.2825	7.386
.2613	7.390	.2829	7.393
.2616	7.389	.2833	7.393
.2620	7.393	.2837	7.387
.2625	7.391	.2859	7.388
.2629	7.390	.2862	7.385
.2634	7.393	.2866	7.385
.2638	7.395	.2870	7.391
.2642	7.390	.2873	7.385
.2645	7.390	.2878	7.386
.2650	7.395	.2881	7.391
.2654	7.393	.2884	7.387
.2658	7.387	.2888	7.391
.2661	7.391	.2892	7.394
.2665	7.383	.2896	7.394
.2669	7.389	.2900	7.385
.2675	7.394	.2903	7.386
.2679	7.390	.2949	7.388

Table 3 (continued)

J.D. hel	V	J.D. hel	V
2441004.2953	7.381	2441004.3155	7.399
.2956	7.387	.3159	7.389
.2961	7.392	.3163	7.388
.2965	7.388	.3167	7.393
.2968	7.388	.3170	7.394
.2974	7.387	.3174	7.394
.2977	7.387	.3178	7.394
.2981	7.383	.3181	7.386
.2985	7.385	.3185	7.393
.2988	7.385	.3189	7.389
.2992	7.381	.3273	7.396
.2997	7.384	.3277	7.399
.3000	7.384	.3280	7.392
.3004	7.390	.3284	7.385
.3008	7.384	.3287	7.397
.3011	7.383	.3291	7.395
.3015	7.388	.3295	7.397
.3018	7.373	.3298	7.396
.3022	7.385	.3302	7.396
.3026	7.383	.3306	7.397
.3029	7.384	.3309	7.410
.3033	7.377	.3313	7.398
.3037	7.388	.3317	7.403
.3040	7.373	.3323	7.404
.3044	7.377	.3325	7.397
.3048	7.377		
.3052	7.389	2443820.7839	7.366
.3055	7.382	.7846	7.368
.3059	7.383	.7860	7.364
.3062	7.387	.7867	7.360
.3066	7.390	.7881	7.364
.3070	7.386	.7888	7.371
.3105	7.394		
.3111	7.397	2443861.6299	7.371
.3115	7.396	.6306	7.383
.3121	7.388	.6312	7.378
.3124	7.387	.6319	7.366
.3128	7.384	.6333	7.368
.3131	7.388	.6340	7.372
.3135	7.391	.6347	7.368
.3139	7.381	.6354	7.365
.3142	7.389	.6361	7.375
.3148	7.389		
.3152	7.383	2443921.5910	7.393

Table 3 (continued)

J.D. hel	V	J.D. hel	V
2443921.5917	7.388	2444139.8451	7.366
.5938	7.392	.8458	7.361
.5944	7.388	.8465	7.363
.5958	7.393	.8472	7.356
.5965	7.389	.8486	7.361
.5972	7.386	.8500	7.353
.5986	7.394	.8507	7.356
.5993	7.386	.8514	7.358
.6000	7.393		
		2444156.8548	7.362
2443948.5238	7.358	.8555	7.362
.5253	7.359	.8562	7.368
.5266	7.362	.8576	7.368
.5280	7.364	.8583	7.373
.5343	7.357	.8590	7.368
.5350	7.363	.8604	7.368
2443960.5229	7.371	2444189.7458	7.377
.5236	7.371	.7465	7.377
.5257	7.357	.7479	7.383
.5270	7.361	.7486	7.378
.5277	7.369	.7500	7.372
.5284	7.364	.7507	7.393
.5291	7.356	.7514	7.393
		.7521	7.393
2444116.8583	7.377		
.8611	7.387	2444242.5486	7.394
.8625	7.385	.5493	7.394
.8632	7.382	.5507	7.399
.8639	7.380	.5528	7.404
.8653	7.380	.5535	7.393
.8660	7.375	.5542	7.399
		.5549	7.393

3. DISCUSSION

The radial velocity observations as a function of phase have been plotted in Fig. 1. Two curves were drawn through the points. One (solid line) representing a circular orbit with an amplitude of 13.5 km/s and the other (dashed line) satisfying the orbital elements of Griffin and Gunn. Although it appears that a circular orbit represents a better fit to our observations, we suspect that our measurements of radial velocities were affected by some instrumental problems with the spectrograph which are also responsible for the large scatter. As a matter of fact, among the 1969 plates about one

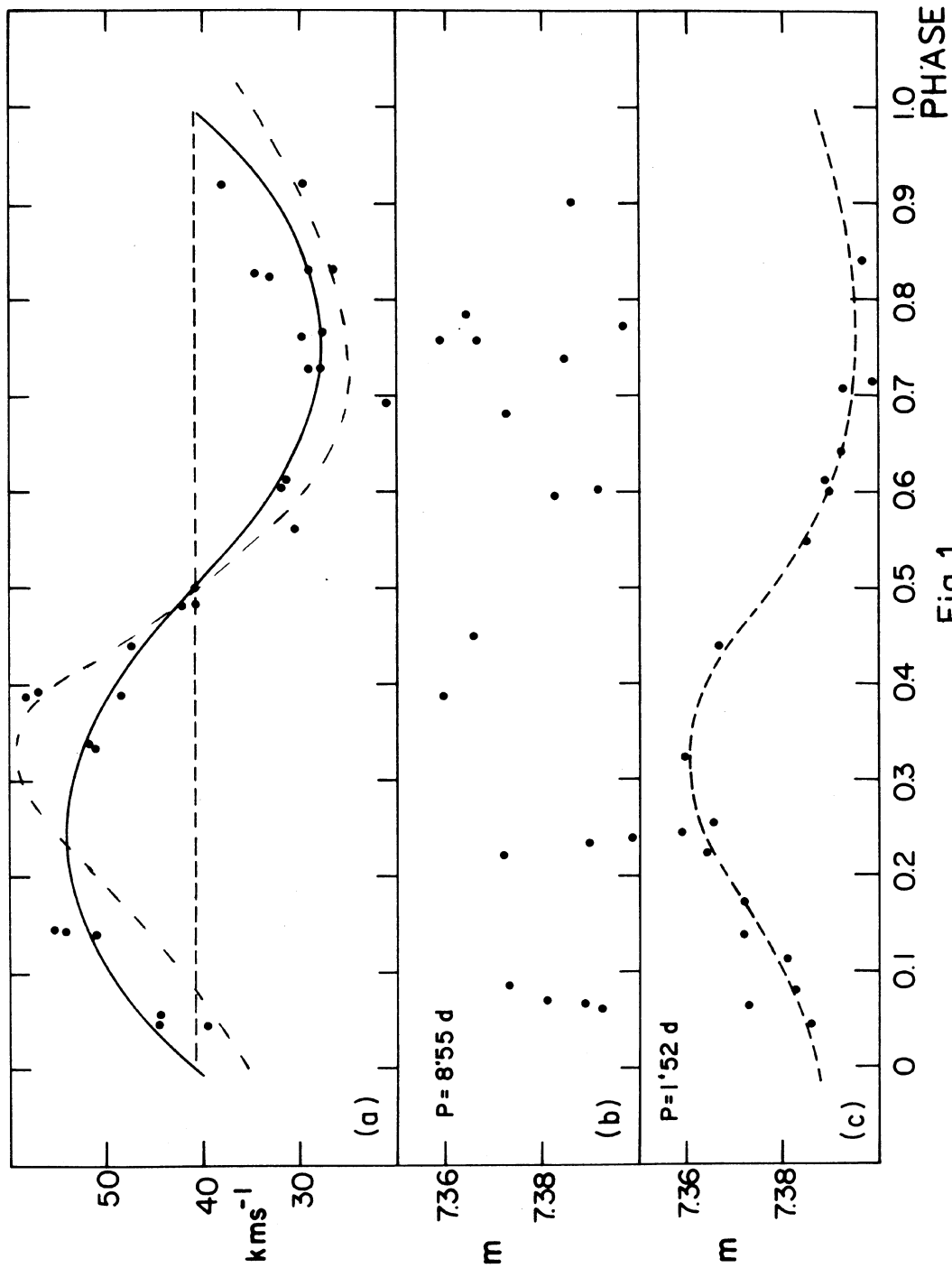


Fig.1

half were eliminated for giving systematically different velocities. In the middle of Fig. 1 is the light curve (b) corresponding to a period of 8.55 days and below the light curve (c) computed with the period of 1.52 days. As can be seen from Table 4, with the exception of the eccentricity, the two sets of orbital elements differ only slightly.

Table 4

Comparison of orbital elements for van Bueren 62		
Element	Griffin and Gunn	Bakos and Tremko
γ (km/s)	38.77	41.0
K (km/s)	16.46	13.5
e	0.233	0.0
a sin i (10^6 km)	1.88	1.65
f(m) (M_{\odot})	0.0036	0.0024
rms. res. (km/s)	0.8	3.6

The photometric observations show small fluctuations of brightness from one night to another. Using the spectroscopic period of 8.55 days, we have computed the phases for all photometric points. Although we have no observations at or near the phases of expected minima (phase 0 or 0.5 in Fig. 1b), the distribution of the nearby points suggests a possible minimum. The four points near phase 0.1 could indicate the ascending branch of an eclipse. On the other hand, at other phases the scatter is unusually large, not expected in photoelectric photometry indicating some kind of variability. Thus we conducted a search for other periods in the range from 240 to 0.85 days by means of the period-finding program of Harmanec (1979). Only one has been found satisfying our observations, namely $P = 1.5194$ days. It could be argued that this may be a fictitious period since some kind of period could be fitted to a limited number of points. We have two reasons to trust our observations. First, there is a span of over ten years between our first and last observation. Secondly, the two sets, plotted separately, produce the same light curve.

The shape of the light curve suggests some kind of intrinsic variability. However, this is unlikely in the primary main sequence star and even less so in the still fainter secondary. Another possibility is the change of brightness due to rotation of a non-spherical body. For the given period and spectral type the expected rotational velocity of vB 62 is 33 km/s, a value close to the average value of the rotational velocities of the late F stars. On the other hand, the measured value of $V \sin i$ is 6 km/s (Kraft, 1965) which could mean that we are viewing the system nearly pole-on. It is not certain whether a rotating non-spherical star with its axis subtending a small angle with the line of sight would produce a measurable photometric variation. It should be pointed out that the projected surface of the star would have to change by only four per cent in order to produce the desired

brightness variation. It is certain though that systematic photometric observations are needed.

4. CONCLUSION

From our observations we have found that the velocity curve of vB 62 is symmetric with an amplitude of 13.5 km/s and the velocity of the system is 41 km/s with respect to the sun. The photometric observations do not favour, but do not exclude an eclipse with a period of 8.5 days. On the other hand, there is a clear indication of a shorter periodic light variation.

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