

ДВОЙНАЯ СИСТЕМА HD 175514

Фотоэлектрические наблюдения

В.И. Бурнашев, Э.А. Витриченко

На телескопе 640 мм Крымской обсерватории получено 1800 фотоэлектрических оценок блеска затменной системы HD 175514. Наблюдения выполнены в 1967-68 гг. с фотоумножителем ЕМ1 6256 В без фильтра.

Определены 6 индивидуальных моментов минимумов. Уточнены период и начальная эпоха.

Сравнение кривых блеска, полученных в разные сезоны, указывает на стабильность изменений блеска.

Photoelectric Observations of HD 175514

By V. I. Burnashev, E. A. Vitrichenko

1800 photoelectric brightness estimates of the eclipsing system HD 175514 were obtained with the 640 mm telescope of the Crimean Observatory. Photomultiplier EMI 6256 B without filter was used in observations of 1967-68. 6 individual moments of minima were determined. The period and the initial epoch were defined.

The comparison of the light curves obtained in different seasons shows the stability of the light variations.

Переменность блеска и лучевой скорости правильного характера у звезды HD 175514 была обнаружена в [1]. Там же приведены предварительные элементы системы, полученные из решения кривых лучевых скоростей и блеска. В [2] подробно обсуждаются характеристики системы. В предлагаемой работе приведены индивидуальные оценки блеска, частично использованные в [1, 2], указан способ их редукции, даны средние кривые блеска (отдельно за два сезона), приведены индивидуальные моменты минимумов и уточнены период и начальная эпоха.

§ 1. Наблюдения и их редукция.

Наблюдения были выполнены в 1967-68 гг. с электрофотометром (без фильтра), имеющемся на телескопе 640 мм

Крымской обсерватории. Применялся фотоумножитель ЕМ1 6256 В с кварцевым окном. Специально система не исследовалась. Перед началом наблюдений в 1968 г. все 4 зеркала телескопа были переалюминированы, так что можно ожидать систематическое различие между двумя сезонами.

Всего получено 1800 оценок блеска. Вероятная ошибка одной оценки в среднем составляет $\pm 0^m.005$. Звездой сравнения была взята HD 175406, постоянство блеска которой проверялось с помощью контрольной звезды сравнения HD 175469. Обе звезды сравнения постоянны с точностью до случайных ошибок наблюдений.

Редукция наблюдений заключалась в приведении моментов наблюдений к Солнцу, в учете дифференциальной экстинкции и цветового уравнения. Наблюдения были выполнены при часовых углах, не выходящих за пределы $\pm 4^h$, так что две последние поправки в сумме меняются от $+ 0^m.001$ до $- 0^m.016$.

Коэффициент дифференциальной экстинкции определялся методом Буге по наблюдениям звезды сравнения. Наблюдения до и после меридиана усреднялись для устранения систематического хода прозрачности и систематического хода чувствительности аппаратуры. В среднем по 5 ночам он оказался равным

$$\alpha_0 = 0.4 \pm 0^m.1,$$

где с величиной α_0 приведена вероятная ошибка. Поправка за дифференциальную экстинкцию для наших наблюдений заключена в пределах от $0^m.000$ до $+ 0^m.005$.

Для определения коэффициента цветового уравнения наблюдались звезды HD 175513, HD 175336 и HD 175406 как без фильтра, так и с фильтрами BG-12 + ЖС-4 и ЖС-18, дающими систему, близкую к BV. Использовалась формула:

$$\alpha_1 = \frac{\Delta m - \alpha_0 [F(z_0) - F(z_*)]}{[F(z_*) - F(z_0)] \Delta C},$$

где Δm — наблюдаемая разность блеска звезд без фильтра, ΔC — наблюдаемая разность цветов звезд в инструментальной системе, $\Delta F(z)$ — разность воздушных масс. Коэффициент α_1 оказался равным

$$- 0^m.050 \pm 0^m.008$$

Инструментальная разность цветов между исследуемой звездой и звездой сравнения по нашим определениям составляет $-0^m.31 \pm 0^m.01$. Поправка блеска за неё заключена в пределах от $0^m.000$ до $-0^m.015$.

Обе поправки определялись только в 1968 г., но приписаны и наблюдениям 1967 г.

В табл.1 представлены индивидуальные наблюдения. Двоеточием отмечены те из них, которые получены в плохую погоду, и из-за низкой точности не использовались в дальнейшей обработке.

Таблица 1

J.D.	Δm	J.D.	Δm	J.D.	Δm	J.D.	Δm
2439...		2439...		2439...		2439...	
652.405	0.666	686.463	0.666	693.403	0.621	696.394	0.693
.411	.673	.466	.661	.406	.616	.397	.696
.414	.658	.470	.661	.408	.616	.399	.706
.422	.673	.476	.666	.413	.613	.404	.699
.428	.670	.479	.691	.416	.618	.411	.684
.433	.685	.482	.689	.418	.612	.415	.675
.438	.710	.490	.676	.424	.610	.421	.685
.442	.685	.493	.696	.426	.610	.426	.635:
.448	.710	.495	.686	.428	.610	.429	.660
.460	.705	.502	.688	.433	.613	.432	.683
.464	.705	.505	.695	.436	.613	.437	.663
.469	.720	.507	.710	.438	.615	.440	.634:
.473	.720	.514	.701	.443	.602	.443	.646
.475	.716	.517	.691	.446	.606	.446	.607:
.483	.706	.519	.684	.448	.612	.457	.652
.487	.735	.525	.700	.454	.606	.459	.664
.492	.734	.528	.722	.456	.612	.462	.684:
.497	.721	.531	.694	.458	.606	.474	.592:
.501	.734	692.319	.752	.463	.613	702.333	.626
.508	.711	.321	.737	.465	.623	.336	.608
.512	.726	.324	.748	.468	.617	.339	.606
.516	.741	.328	.750	.473	.620	.347	.607
657.451	.706	.362	.768:	.475	.615	.351	.615
670.375	.740	.365	.765:	.478	.604	.354	.602
.379	.745	.429	.676	.484	.612	.380	.608
.383	.743	.434	.671	.487	.611	.383	.610
.391	.796	.436	.671	.490	.613	703.306	.618
.396	.725	.440	.663	.497	.614	.309	.630
.399	.724	.447	.666	.500	.620	.312	.628
.408	.716	.452	.674	.503	.610	.318	.626
.412	.718	693.353	.635	694.308	.619	.321	.621
.415	.711	.356	.624	.311	.609	.324	.636
686.410	.649	.358	.626	.314	.609	.330	.626
.414	.643	.363	.616	.320	.602	.333	.629
.418	.643	.365	.627	.323	.608	.335	.631
.424	.643	.368	.638	.337	.608	.341	.631
.427	.661	.376	.614	.340	.612	.358	.639
.430	.673	.379	.626	.343	.618	.362	.636
.437	.652	.384	.614	.349	.614	.365	.646
.440	.652	.386	.613	.353	.609	.373	.649
.443	.662	.388	.601	.356	.604	.377	.649
.450	.688	.394	.607	696.382	.694	.381	.642
.454	.658	.396	.610	.385	.694	.389	.640
.456	.675	.399	.611	.388	.696	.393	.665

Таблица 1 (продолжение)

J.D.	Δm	J.D.	Δm	J.D.	Δm	J.D.	Δm
2439...		2439...		2439...		2439...	
703.397	0.660	711.387	0.608	718.257	0.735	725.296	0.630
.404	.648	.394	.619	.260	.743	.298	.640
.407	.660	.396	.618	.262	.742	.341	.644
.410	.675	.400	.615	.273	.734	.344	.631
.416	.661	713.269	.728	.283	.739	726.248	.742
.419	.664	.271	.725	.285	.749	.252	.740
.423	.659	.274	.752	.288	.759	.254	.728
.429	.649	.281	.765:	.292	.739	.268	.754
.433	.654	.285	.770:	.294	.726	.271	.753
.436	.666	.294	.739	.297	.731	.273	.729
.439	.686	.299	.746	.300	.729	.275	.744
.445	.658	.301	.733	.303	.724	.279	.756
.449	.663	.323	.763	.307	.719	.281	.766
.451	.670	.324	.778	.310	.718	.284	.759
.458	.665	.328	.763	.313	.716	.288	.763
.461	.667	.332	.769	.314	.708	.290	.761
.463	.662	.335	.776	.318	.708	.293	.769
710.255	.714:	.354	.789	.321	.716	.295	.759
.258	.724:	.358	.762	.324	.701	.301	.779
.260	.683	.361	.788	.327	.698	.305	.769
.262	.663	.367	.788	.330	.683	.309	.769
.264	.676	.371	.755	.334	.699	.311	.783
.276	.665	.375	.762	.335	.681	.314	.779
.279	.665	.388	.798:	720.262	.602	.317	.778
.282	.680	.392	.796:	.265	.600	.320	.789
711.300	.615	.402	.768	.270	.601	.322	.781
.304	.583:	.405	.759	.272	.621	.329	.772
.308	.611	.409	.729	.339	.626	.332	.772
.315	.608	.417	.733	.343	.629	.336	.782
.318	.623	.419	.743	.346	.616	.340	.775
.321	.623	.423	.738	.350	.631	.343	.775
.328	.613	.430	.714	.353	.642:	.346	.772
.330	.619	.433	.728	.356	.603	.349	.765
.334	.606	714.305	.653	.358	.601	.356	.761
.341	.604	.310	.651	725.249	.623	.359	.761
.344	.603	.312	.651	.273	.615	.361	.757
.353	.613	.317	.646	.275	.640	.364	.759
.356	.619	.319	.649	.278	.632	.367	.774
.359	.613	.321	.649	.280	.625	.370	.767
.366	.548:	.326	.651	.283	.622	.377	.750
.369	.611	.329	.658	.286	.630	.381	.758
.372	.614	.332	.649	.288	.638	.384	.745
.380	.604	.336	.656	.290	.648	.388	.755
.383	.609	718.254	.762	.294	.642	.392	.747

Таблица 1 (продолжение)

J.D.	Δm	J.D.	Δm	J.D.	Δm	J.D.	Δm
2439...		2439...		2439...		2439...	
726.396	0.736	747.354	0.752	968.501	0.606	969.559	0.753
.401	.731	.355	.753	.505	.621	.561	.761
744.278	.715	.357	.737	.508	.623	.564	.755
.280	.720	.360	.750	.512	.609	.567	.754
.282	.693	.361	.760	.515	.626	971.457	.642
.284	.732:	968.472	.692	.518	.642	.460	.646
.287	.692	.475	.708	.521	.643	.464	.657
.289	.695	.477	.709	.525	.628	.466	.652
.292	.687	.480	.703	.530	.635	.468	.645
747.300	.719	.483	.693	.532	.643	.470	.644
.301	.696	.486	.696	.535	.643	.472	.649
.302	.704	.488	.672	.539	.638	.475	.637
.303	.707	.491	.673	.543	.641	.478	.629
.305	.714	.493	.675	.546	.634	.480	.638
.306	.697	.495	.689	.549	.634	.482	.634
.307	.712	.499	.671	.553	.639	.483	.630
.308	.707	.502	.688	.556	.634	.485	.626
.310	.704	.505	.678	.560	.631	.488	.634
.311	.704	.507	.681	.564	.635	.490	.641
.312	.703	.511	.683	.568	.617	.493	.642
.314	.713	.514	.666	969.501	.702	.495	.636
.316	.714	.516	.669	.504	.703	.497	.627
.317	.718	.520	.669	.506	.706	.500	.620
.319	.709	.523	.663	.508	.698	.503	.630
.321	.733	.525	.667	.512	.700	.505	.630
.322	.714	.528	.672	.514	.707	.507	.644
.323	.720	.532	.658	.517	.702	.509	.623
.325	.726	.534	.663	.520	.721	.513	.633
.327	.720	.536	.668	.521	.727	.515	.626
.328	.733	.540	.664	.523	.726	.517	.631
.330	.724	.543	.668	.526	.723	.519	.631
.331	.724	.549	.663	.530	.727	.521	.627
.332	.724	.552	.663	.532	.728	.524	.619
.335	.736	.556	.655	.535	.730	.526	.624
.337	.739	.559	.664	.537	.733	.528	.629
.338	.747	.561	.662	.540	.727	.530	.627
.339	.747	968.475	.613	.542	.732	.532	.613
.340	.736	.478	.625	.545	.741	.534	.614
.347	.753	.482	.614	.547	.745	.536	.624
.348	.750	.485	.605	.550	.748	.538	.624
.350	.739	.489	.610	.553	.747	.540	.622
.351	.729	.491	.637	.555	.745	.542	.624
.353	.743	.494	.630	.557	.755	975.434	.645
		.498	.620				

Таблица 1 (продолжение)

J.D.	Δm	J.D.	Δm	J.D.	Δm	J.D.	Δm
2439...		2439...		2439...		2439...	
975.436	0.642	981.496	0.619	983.480	0.676	986.427	0.633
.439	.646	.499	.623	.495	.678	.430	.631
.442	.636	.501	.619	.497	.698	.433	.626
.445	.641	.503	.625	.500	.686	.436	.634
.448	.643	.506	.623	.502	.679	.439	.632
.450	.649	.508	.629	.504	.681	.442	.616:
.453	.646	.510	.626	.508	.684	.445	.647
.455	.647	.512	.624	.510	.674	.447	.648
.457	.642	.515	.627	.512	.669	.449	.637
.460	.627	.520	.628	.515	.671	.452	.633
.464	.670:	.522	.633	.517	.681	.455	.634
.466	.644	.524	.634	.528	.662	.458	.644
.468	.654	.526	.631	.531	.662	.460	.648
.475	.644	.528	.629	.533	.668	.463	.644
.477	.640	.530	.634	.536	.655	.464	.643
.479	.640	.532	.640	.538	.668	.467	.642
.481	.655	.533	.625	.540	.658	.469	.666:
.484	.626	.540	.615	.543	.668	.472	.652
.494	.618	983.415	.719	.546	.657	.475	.635
977.432	.606	.417	.716	984.432	.648	.477	.642
.434	.633	.419	.727	.435	.651	.478	.650
.437	.621	.422	.725	.437	.621	.483	.650
.439	.610	.424	.733	.440	.644	.485	.643
.441	.646	.427	.719	.442	.636	.488	.640
.449	.626	.429	.714	.445	.622	.490	.640
.469	.635	.432	.721	.448	.627	.493	.646
.471	.646	.434	.730	.451	.637	.494	.649
.474	.646	.436	.718	.454	.640	.497	.659
981.435	.605	.438	.718	.457	.641	.499	.659
.437	.610	.440	.757:	.460	.631	.502	.661
.440	.607	.442	.696	.463	.634	.505	.659
.442	.617	.446	.709	.466	.618	.508	.647
.445	.613	.448	.700	.469	.621	988.393	.654
.448	.598	.450	.727	.471	.639	.396	.665
.450	.604	.452	.710	.474	.617	.399	.650
.453	.605	.455	.697	.477	.639	.404	.659
.456	.607	.457	.723	.480	.612	.408	.658
.458	.609	.459	.674:	986.394	.614	.414	.649
.471	.622	.461	.718	.396	.606:	.417	.644
.473	.612	.463	.706	.399	.619	.420	.634
.475	.616	.465	.694	.403	.623	.425	.655
.477	.622	.468	.694	.405	.624	.428	.654
.481	.619	.471	.698	.408	.636	.433	.646
.484	.614	.474	.694	.411	.627	.436	.642
.487	.621	.476	.689	.414	.642	.439	.645
.490	.611	.478	.709	.417	.626	.443	.647
.492	.626	.485	.697	.422	.637	.446	.647
.494	.622	.487	.692	.424	.630	.452	.638

Таблица 1 (продолжение)

J. D.	Δm	J. D.	Δm	J. D.	Δm	J. D.	Δm
2439...		2439...		2439...		2439...	
988.454	0.641	989.446	0.612	989.544	0.619	990.484	0.659
.457	.638	.449	.616	.546	.625	.486	.650
.461	.642	.451	.608	.548	.628	.488	.650
.464	.639	.454	.605	990.381	.612	.490	.649
.467	.645	.456	.606	.383	.605	.492	.652
.471	.629	.458	.607	.386	.601	.497	.652
.474	.640	.460	.598	.389	.616	.499	.658
.476	.636	.463	.599	.391	.617	.501	.652
.479	.633	.466	.603	.393	.604	.503	.654
.482	.636	.468	.606	.396	.605	.505	.658
.484	.633	.470	.596	.399	.615	.507	.659
.486	.630	.472	.599	.401	.616	.509	.656
.489	.627	.474	.602	.403	.631	.511	.656
.491	.639	.476	.610	.405	.636	.513	.660
.494	.614	.480	.604	.409	.626	.515	.663
.496	.624	.482	.607	.410	.624	.517	.663
.498	.624	.484	.608	.412	.633	.519	.667
.501	.629	.486	.601	.416	.639	.521	.661
.504	.621	.488	.600	.419	.628	.523	.665
.507	.619	.490	.609	.421	.624	.525	.666
.512	.630	.493	.594	.429	.622	.527	.671
.514	.632	.494	.610	.431	.636	.529	.666
.516	.635	.499	.598	.433	.640	.531	.662
.518	.628	.501	.601	.435	.631	.534	.665
.520	.638	.503	.603	.437	.640	.536	.666
.523	.625	.505	.604	.440	.632	.538	.670
.525	.632	.507	.600	.442	.641	.540	.672
.527	.625	.509	.600	.444	.642	.542	.675
.529	.625	.511	.599	.446	.642	.545	.667
.532	.638	.514	.614	.448	.647	.547	.677
.535	.629	.516	.609	.450	.643	994.440	.605
.537	.619	.518	.614	.452	.636	.442	.606
.539	.623	.520	.611	.454	.645	.444	.615
.542	.619	.522	.612	.456	.644	.447	.616
.544	.623	.524	.614	.460	.641	.449	.612
.547	.619	.526	.606	.463	.639	.451	.617
989.430	.608	.529	.619	.465	.640	.453	.612
.432	.620	.531	.622	.467	.639	.456	.611
.435	.613	.533	.602	.469	.654	.459	.623
.438	.608	.535	.606	.471	.645	.461	.632
.439	.610	.538	.611	.473	.649	.463	.633
.442	.614	.540	.610	.475	.657	.465	.612
.444	.614	.542	.615	.482	.657	.466	.620

Таблица 1 (продолжение)

J. D.	Δm	J. D.	Δm	J. D.	Δm	J. D.	Δm
2439...		2440...		2440....		2440....	
994.468	0.620	000.384	0.746	000.491	0.742	013.372	0.765
.472	.617	.387	.742	.493	.741	.375	.761
.475	.627	.389	.741	.495	.741	.377	.766
.477	.622	.391	.748	.497	.735	.379	.765
.479	.615	.393	.748	.499	.737	.381	.763
.482	.620	.398	.764	.501	.737	.383	.756
.484	.616	.402	.756	.508	.736	.385	.768
.486	.625	.404	.762	.510	.732	.387	.767
.488	.628	.406	.768	.512	.733	.389	.762
.491	.614	.409	.755	.514	.727	.391	.759
.493	.622	.411	.766	.517	.725	.393	.762
.494	.616	.413	.764	.519	.720	.395	.761
.496	.630	.415	.768	.521	.722	.397	.771
.498	.628	.418	.766	.523	.717	.399	.767
.500	.626	.420	.771	.525	.720	.401	.771
.502	.629	.422	.776	.528	.707	.404	.768
.504	.632	.425	.765	.530	.701	.406	.769
.506	.631	.427	.764	.532	.701	.408	.771
.509	.624	.429	.761	.535	.701	.410	.768
.511	.629	.431	.767	.537	.700	.412	.773
.513	.618	.434	.770	013.310	.693	.417	.781
.516	.623	.439	.771	.313	.695	.419	.773
.519	.631	.442	.770	.316	.700	.421	.770
.521	.626	.446	.777	.319	.698	.423	.773
.523	.624	.448	.776	.322	.714	.425	.775
.525	.633	.451	.777	.324	.706	.428	.768
.527	.635	.453	.767	.327	.721	.430	.779
.529	.629	.455	.764	.330	.707	.432	.763
.531	.635	.457	.768	.333	.721	.434	.764
.533	.636	.459	.759	.335	.720	.436	.764
.534	.637	.462	.766	.337	.719	.438	.768
.536	.635	.464	.761	.340	.730	.440	.760
2440....		.466	.767	.342	.735	.442	.777
000.360	.734	.468	.758	.345	.738	.444	.760
.362	.728	.470	.758	.347	.741	.446	.778
.365	.741	.473	.749	.353	.743	.448	.760
.367	.734	.476	.757	.355	.750	.450	.755
.370	.745	.478	.760	.357	.751	.452	.755
.372	.759	.480	.755	.360	.747	.454	.757
.374	.736	.482	.747	.362	.748	.457	.750
.377	.747	.484	.750	.365	.755	.460	.755
.380	.741	.486	.749	.367	.759	.462	.743
.382	.737	.488	.750	.369	.763	.464	.743

Таблица 1 (продолжение)

J.D.	Δm	J.D.	Δm	J.D.	Δm	J.D.	Δm
2440...		2440...		2440...		2440...	
013.466	0.741	015.384	0.616	017.321	0.654	017.432	0.715
.468	.739	.386	.612	.323	.659	.434	.720
.470	.745	.388	.614	.326	.653	.436	.724
.473	.750	.391	.610	.328	.644	.438	.719
.476	.745	.393	.614	.331	.645	.440	.729
.478	.728	.395	.617	.333	.661	.443	.724
.480	.721	.397	.607	.335	.651	.446	.730
.483	.736	.399	.607	.337	.647	.448	.732
.485	.726	.401	.612	.342	.663	.450	.730
.487	.736	.404	.608	.344	.683	.452	.734
.489	.741	.406	.608	.346	.661	.455	.729
.491	.720	.408	.607	.348	.673	.457	.727
.494	.742	.411	.608	.351	.675	.459	.726
.497	.732	.413	.606	.354	.678	.461	.727
.499	.723	.416	.614	.357	.679	.463	.736
015.323	.612	.418	.609	.359	.670	.467	.732
.325	.617	.420	.609	.362	.677	.469	.727
.326	.618	.422	.606	.365	.684	.471	.727
.329	.614	.424	.603	.367	.677	.473	.731
.331	.604	.427	.614	.369	.685	.476	.735
.333	.606	.428	.604	.375	.690	.478	.723
.335	.620	.430	.609	.376	.690	.480	.728
.337	.609	.432	.612	.378	.688	.482	.722
.339	.616	.434	.607	.381	.696	.484	.725
.341	.611	.437	.606	.384	.687	.486	.725
.343	.613	.439	.607	.386	.687	.489	.732
.345	.615	.442	.604	.388	.692	.491	.732
.349	.619	.444	.602	.391	.697	.493	.722
.351	.613	.446	.601	.394	.702	.495	.718
.353	.609	.449	.605	.396	.699	.497	.726
.355	.611	.452	.612	.398	.708	.500	.725
.357	.614	.454	.610	.401	.709	.502	.726
.359	.622	.456	.610	.403	.708	.504	.721
.361	.609	.458	.607	.406	.710	.507	.729
.363	.609	.461	.611	.408	.717	.510	.721
.364	.614	.463	.607	.410	.717	.512	.711
.366	.611	.466	.616	.413	.720	.514	.714
.369	.602	.468	.611	.415	.710	.516	.712
.371	.609	.471	.615	.418	.712	.519	.714
.373	.616	017.308	.645	.421	.728	.521	.720
.375	.611	.311	.637	.423	.719	019.310	.637
.377	.616	.313	.652	.425	.715	.313	.634
.380	.609	.316	.655	.427	.724	.316	.603
.382	.612	.319	.658	.429	.721	.319	.611

Таблица 1 (продолжение)

J.D.	Δm	J.D.	Δm	J.D.	Δm	J.D.	Δm
2440...		2440...		2440....		2440...	
019.321	0.609	019.428	0.611	019.526	0.608	035.423	0.654
.324	.609	.430	.611	027.362	.651	.425	.669
.327	.611	.432	.603	.365	.636	.431	.675
.331	.610	.434	.611	.368	.643	.433	.656
.333	.622	.436	.610	.371	.647	.436	.654
.336	.623	.438	.611	.373	.645	.441	.670
.338	.628	.440	.606	.376	.641	.444	.640
.340	.627	.442	.606	.379	.633	.446	.644
.343	.623	.444	.610	.382	.650	.449	.645
.345	.619	.446	.610	.386	.635	.451	.647
.347	.625	.448	.606	.389	.629	.453	.656
.349	.623	.450	.608	.397	.640	.456	.646
.351	.622	.453	.611	.400	.634	.459	.645
.353	.619	.455	.610	033.303	.611	.461	.649
.356	.624	.457	.603	.307	.598	.463	.638
.359	.630	.459	.597	.311	.594	.467	.638
.361	.615	.462	.607	.313	.601	.489	.633
.363	.628	.464	.611	.315	.604	.473	.650
.365	.621	.467	.608	.318	.615	.474	.628
.368	.619	.470	.601	.321	.602	.476	.626
.372	.625	.472	.600	.324	.609	.478	.634
.374	.621	.474	.609	.326	.605	.481	.638
.376	.612	.477	.604	.336	.607	.483	.640
.378	.612	.479	.606	.338	.601	.486	.633
.381	.608	.481	.613	.340	.610	.489	.626
.383	.617	.483	.596	.342	.615	.491	.647
.387	.612	.485	.607	.345	.610	.493	.641
.389	.614	.487	.612	.347	.607	.496	.640
.393	.623	.489	.610	.349	.612	.498	.645
.396	.617	.491	.603	034.372	.684	.501	.629
.398	.617	.493	.611	.375	.696	.503	.636
.400	.620	.495	.607	.377	.687	.506	.629
.401	.620	.498	.610	.380	.695	.508	.628
.403	.613	.500	.611	.384	.698	.510	.638
.406	.612	.502	.614	.388	.690	.512	.624
.408	.623	.504	.618	.390	.700	.515	.637
.410	.614	.506	.606	.392	.691	.517	.631
.412	.618	.508	.611	.395	.690	.520	.635
.414	.613	.510	.615	.398	.705	036.295	.645
.416	.609	.512	.607	.401	.710	.304	.643
.418	.614	.514	.600	.404	.710	.306	.648
.420	.605	.519	.598	.406	.708	.309	.650
.422	.608	.521	.608	035.392	.682	.311	.650
.424	.608	.523	.615	.395	.679	.313	.655

Таблица 1 (продолжение)

J.D.	Δm	J.D.	Δm	J.D.	Δm	J.D.	Δm
2440...		2440...		2440...		2440...	
036.315	0.644	052.415	0.711	052.518	0.644	053.475	0.605
.318	.642	.418	.706	.520	.648	.477	.606
.320	.654	.419	.708	.522	.650	.480	.611
.322	.655	.421	.710	.524	.651	.482	.619
.324	.648	.423	.714	.526	.636	.484	.598
.326	.645	.425	.703	.528	.634	.486	.606
.330	.626	.427	.701	.531	.638	.488	.608
.336	.643	.429	.691	.533	.642	.491	.608
.338	.643	.431	.694	.535	.637	.494	.601
045.458	.599	.433	.697	053.360	.631	.496	.603
.461	.604	.435	.697	.363	.638	.499	.599
.465	.598	.440	.694	.365	.633	.501	.605
.468	.617	.442	.690	.370	.628	.504	.609
052.336	.767	.444	.691	.372	.631	.507	.613
.337	.766	.446	.690	.384	.636	.509	.605
052.339	.770	.448	.680	.390	.631	.513	.609
.342	.769	.450	.676	.392	.621	.515	.610
.344	.783	.451	.670	.395	.623	.517	.617
.347	.784	.454	.685	.397	.631	055.372	.655
.349	.777	.456	.675	.399	.626	.373	.651
.351	.770	.458	.684	.401	.624	.375	.650
.354	.778	.462	.666	.404	.626	.377	.648
.356	.769	.464	.673	.406	.619	.388	.655
.358	.762	.466	.666	.408	.623	.390	.653
.360	.773	.469	.676	.410	.623	.391	.657
.362	.770	.471	.662	.412	.619	.393	.652
.365	.769	.473	.660	.415	.626	.395	.660
.367	.770	.475	.661	.423	.618	.397	.660
.369	.766	.477	.664	.426	.623	.399	.661
.371	.757	.483	.645	.428	.633	.401	.660
.373	.763	.486	.667	.431	.626	.411	.661
.376	.761	.488	.649	.433	.615	.413	.659
.378	.750	.490	.663	.435	.620	.415	.663
.380	.751	.492	.654	.437	.625	.417	.660
.382	.749	.494	.648	.439	.628	.419	.663
.384	.746	.496	.649	.449	.608	.430	.670
.388	.742	.498	.642	.451	.611	.433	.665
.390	.738	.500	.647	.454	.610	.436	.659
.392	.736	.502	.651	.456	.614	.438	.677
.394	.736	.504	.646	.458	.618	.440	.683
.396	.741	.506	.651	.461	.619	.447	.675
.398	.738	.508	.653	.463	.620	.449	.688
.409	.719	.510	.654	.465	.619	.451	.686
.411	.711	.512	.644	.468	.616	.453	.686
.413	.714	.514	.650	.473	.614	.455	.684
		.516	.653				

Таблица 1 (продолжение)

J.D.	Δm	J.D.	Δm	J.D.	Δm	J.D.	Δm
2440 ...		2440...		2440...		2440...	
055.457	0.678	056.346	0.723	056.456	0.703	063.391	0.624
.459	.684	.348	.713	.462	.693	.393	.632
.461	.685	.350	.716	.464	.700	.396	.626
.463	.689	.352	.714	.466	.687	.398	.630
.469	.690	.354	.719	.468	.688	.400	.623
.471	.692	.360	.726	.470	.690	.402	.625
.479	.701	.362	.728	.472	.689	.405	.630
.481	.706	.364	.728	.474	.682	.407	.631
.483	.710	.366	.720	.476	.676	.409	.633
.485	.700	.368	.725	.480	.674	.410	.632
.487	.703	.373	.731	.482	.673	.412	.634
.489	.707	.376	.717	.484	.676	.414	.639
.491	.712	.378	.716	.486	.673	.416	.640
.506	.727	.380	.717	.488	.672	.418	.636
.509	.727	.383	.721	.490	.668	.420	.636
.511	.738	.387	.728	.493	.663	.423	.631
.513	.730	.389	.724	.495	.652	.425	.635
.515	.744	.392	.726	.501	.664	.428	.639
.517	.737	.394	.726	.504	.676	.430	.642
.519	.734	.396	.726	.507	.658	.432	.640
.529	.748	.398	.733	.509	.649	.433	.643
.533	.758	.400	.726	.511	.665	.435	.637
056.290	.682	.402	.722	.513	.635	.437	.631
.293	.691	.404	.720	.515	.656	.442	.643
.295	.685	.406	.725	.517	.651	.444	.634
.301	.688	.408	.722	.522	.653	.446	.635
.303	.692	.410	.712	.524	.647	.448	.646
.305	.694	.417	.718	.528	.643	.450	.639
.307	.689	.419	.716	.530	.643	.452	.643
.309	.689	.421	.713	.536	.643	.453	.638
.311	.703	.423	.717	063.330	.602	.455	.644
.313	.697	.426	.713	.337	.613	.457	.649
.315	.693	.428	.708	.339	.604	.461	.643
.317	.694	.430	.721	.341	.616	.463	.635
.319	.704	.433	.710	.343	.613	.465	.642
.321	.690	.435	.717	.345	.616	.467	.643
.323	.698	.439	.716	.347	.610	.469	.647
.325	.714	.442	.710	.349	.612	.471	.652
.327	.699	.444	.710	.352	.613	.473	.650
.333	.704	.446	.712	.354	.619	.475	.648
.336	.705	.448	.700	.356	.614	.477	.654
.338	.700	.450	.704	.358	.622	064.330	.649
.342	.711	.452	.700	.360	.620	.332	.645
.344	.714	.454	.689	.388	.631	.334	.651

Таблица 1 (окончание)

J.D.	Δm	J.D.	Δm	J.D.	Δm	J.D.	Δm
2440...		2440...		2440...		2440...	
064.336	0.653	064.352	0.660	064.369	0.659	064.387	0.681
.338	.657	.355	.665	.371	.671	.389	.697
.340	.652	.357	.662	.373	.671	.391	.670
.343	.658	.360	.666	.376	.670	.395	.676
.345	.656	.362	.670	.380	.676	.398	.685
.348	.658	.364	.665	.382	.683	.401	.690
.350	.657	.366	.656	.385	.686		

§ 2. Уточнение периода и начальной эпохи.

Для тех наблюдений, которые проходят через минимумы, были образованы 6-8 средних точек вблизи момента минимума. Методом наименьших квадратов искалась абсцисса вершины параболы, проходящей через эти средние точки. Полученные таким способом индивидуальные моменты минимумов представлены в табл. 2.

Таблица 2

Min		E	σ	0-C
2439713.352	I	38	± 0.004	-0.001
26.329	I	46	.006	0.000
40000.435	I	215	.001	+0.001
13.409	I	223	.002	0.000
17.465	II	225	.002	+0.001
56.388	II	249	.002	-0.002

Здесь I обозначает главный минимум, II - вторичный. В третьей и четвертой колонках приведены число периодов после начальной эпохи и квадратичная ошибка определения момента. Исправленные элементы:

$$\text{Min I} = \text{J.D. } 2439651.720 + 1.621924 \cdot E$$

$\pm 1 \qquad \qquad \pm 6$

Полученные с этими элементами величины 0-C приведены в последней колонке табл.2. При определении 0-C для вторичных минимумов к моменту наблюдений прибавлялась величина $P/2$. Как видно из табл.2, смещение вторичного минимума относительно фазы 0.5 отсутствует в пределах точности наблюдений.

§ 3. Кривая блеска.

На рис.1 приведена кривая блеска, построенная по наблюдениям 1968 года (кружки) и 1967 года (точки). Вертикальные черточки указывают квадратичную ошибку. Каждая точ-

ка представляет собой среднее из 10-30 индивидуальных наблюдений (в среднем 18).

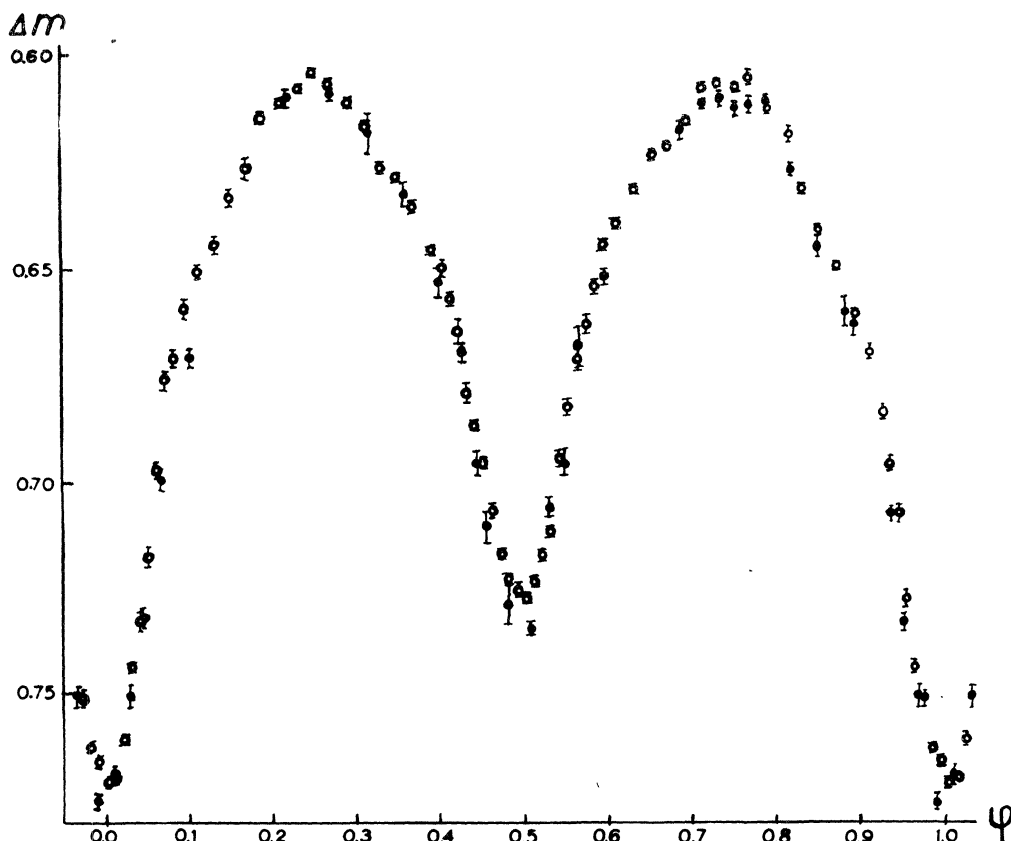


Рис. 1. Средняя кривая блеска HD 175514. Наблюдения 1968 года показаны кружками, наблюдения 1967 года — точками.

При построении кривой блеска не были замечены систематические различия между наблюдениями в разные ночи одного сезона. Различие между кривыми блеска, полученными в разные сезоны, также невелико. Из рис.1 видно, что точки 1968 года лежат несколько выше точек 1967 года. Это небольшое (около $0^m.005$) различие может быть связано с переалюминированием зеркал телескопа. Эффект вызывается различием цветов исследуемой звезды и звезды сравнения. В таком случае можно сделать вывод о стабильности кривой блеска.

Решению кривой блеска будет посвящена отдельная статья авторов.

Литература

1. Э.А.Витриченко, АЦ №448, 6, 1967.
2. Э.А.Витриченко, Изв. КраО 40, 82, 1969.

Крымская астрофизическая
обсерватория АН СССР

Январь 1969 г.