

**NO. 112 UBVRIJKL LIGHT CURVES OF CLASSICAL CEPHEIDS**

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**ABSTRACT**

Observations of classical Cepheids are presented. Analyses will be published separately.

We have made multicolor photoelectric observations on the UBVRIJKL system (Johnson, Mitchell, Iriarte and Wisniewski 1966) for 20 classical Cepheid variable stars. For 18 of these stars, the observations extend from the ultraviolet to  $2.2\mu$  or  $3.4\mu$  in the infrared; for two, the data are limited to the UBVRI filters.

The individual observations are listed in Table 1. This table is divided into two parts; the first, contains the UBVRI data and the second, the JKL data. Since the photometric apparatus was the same as that used on the bright star program, the probable errors listed by Johnson, et al., (1966) also apply to the data of Table 1.

The data of Table 1 are sufficient to define light curves for these stars as wavelengths ranging from the ultraviolet to the infrared. Figures 1-20 show the observed light curves. The UBV data listed by Mitchell, Iriarte, Steinmetz and Johnson (1964) were also plotted, thereby increasing the weights of the UBV curves.

The light curves shown in Figures 1-20 exhibit the well-known shift of phase with wavelength. For example, the times of maximum and minimum light for T Mon shift to later and later phases as one progresses from U to L (from  $0.36\mu$  to  $3.4\mu$ ). On the other hand several stars (SU Cas, DT Cyg and SZ Tau) seem not to show much phase shift. These same three stars are also almost constant in light output at  $2.2\mu$  and  $3.4\mu$  (K and L magnitudes).

Another group of stars ( $\eta$  Aql, U Aql, W Gem, S Sge and U Sge) exhibit another effect. These stars have secondary "bumps" on the visual light curves; as we proceed to the longer wavelengths these secondary "bumps" become the primary maxima. We suggest that this effect may be related to the phase shifts exhibited by stars with assymetrical light curves; for example, T Mon and X Cyg.

We are preparing, for separate publication, analyses of the data given here in terms of the bolometric light curves and effective temperature curves. The combination of our data with the known radial velocity curves enables us to compute the absolute magnitude for each of these Cepheid variable stars. Our absolute magnitude determinations are entirely empirical and do not depend upon stellar model computations. The results of these analyses will be published in the near future.

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**REFERENCES**

- Johnson, H. L., Mitchell, R. I., Iriarte, B. and Wiśniewski, W. Z. 1966, *Comm. Lunar and Planet. Lab.*, 4, 99.  
 Mitchell, R. I., Iriarte, B., Steinmetz, D. and Johnson, H. L. 1964, *Bol. Obs. Tonantzintla y Tacubaya*, 3, 153.

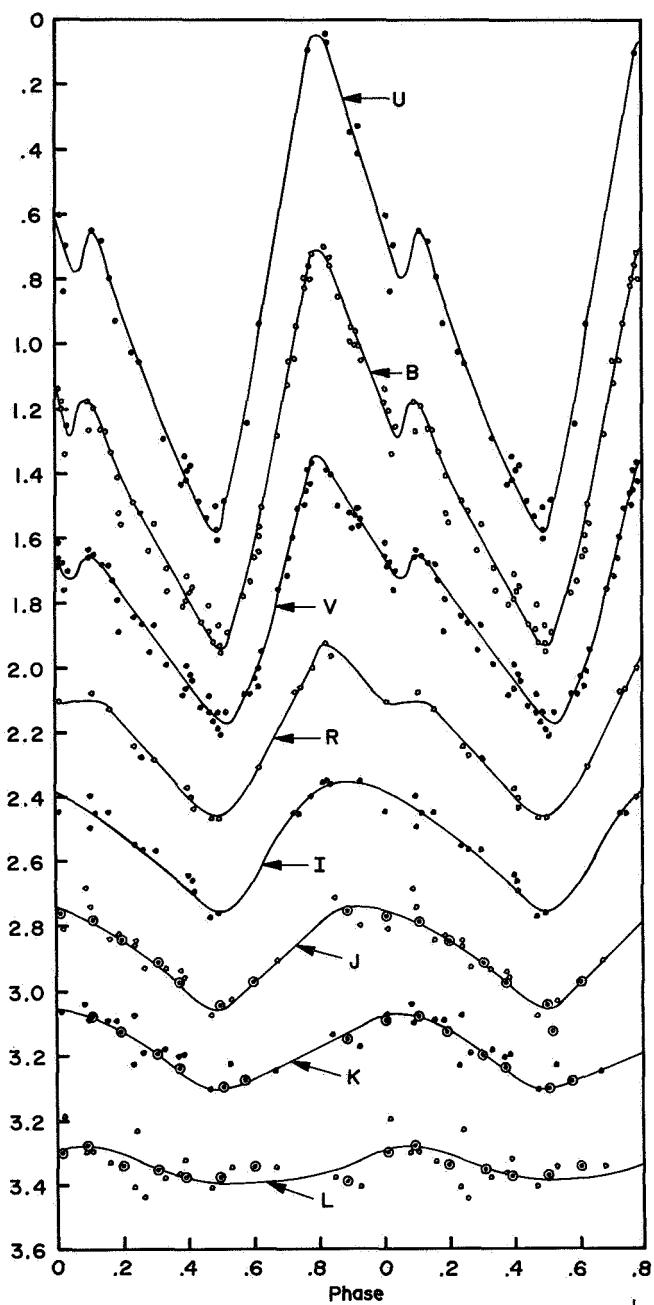


Fig. 1 The light curves for *U* Aql. Vertical scale gives magnitude differences with arbitrary zero point.

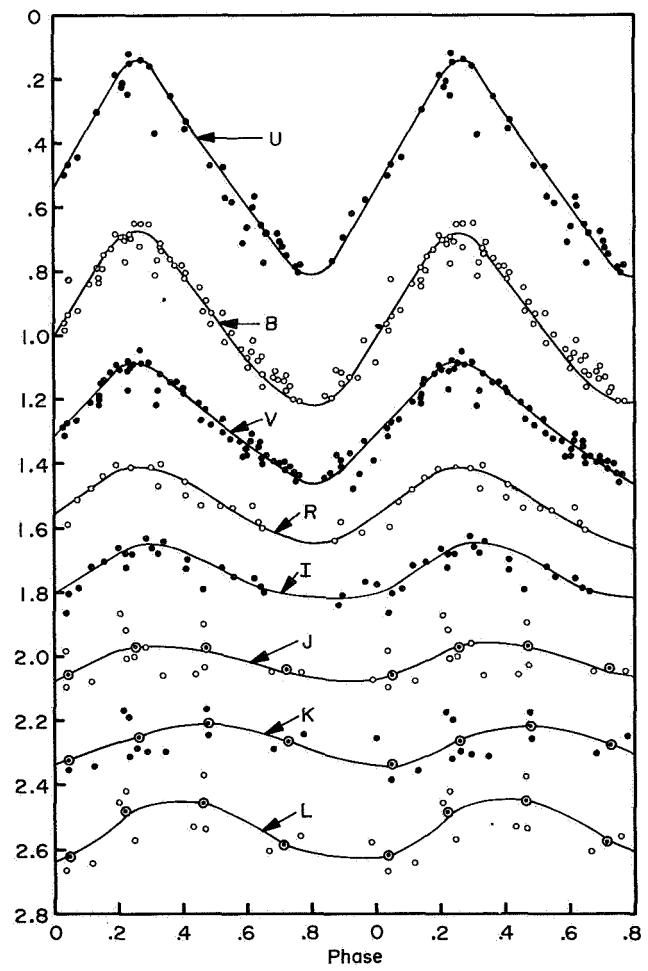


Fig. 2 The light curves for *FF* Aql.

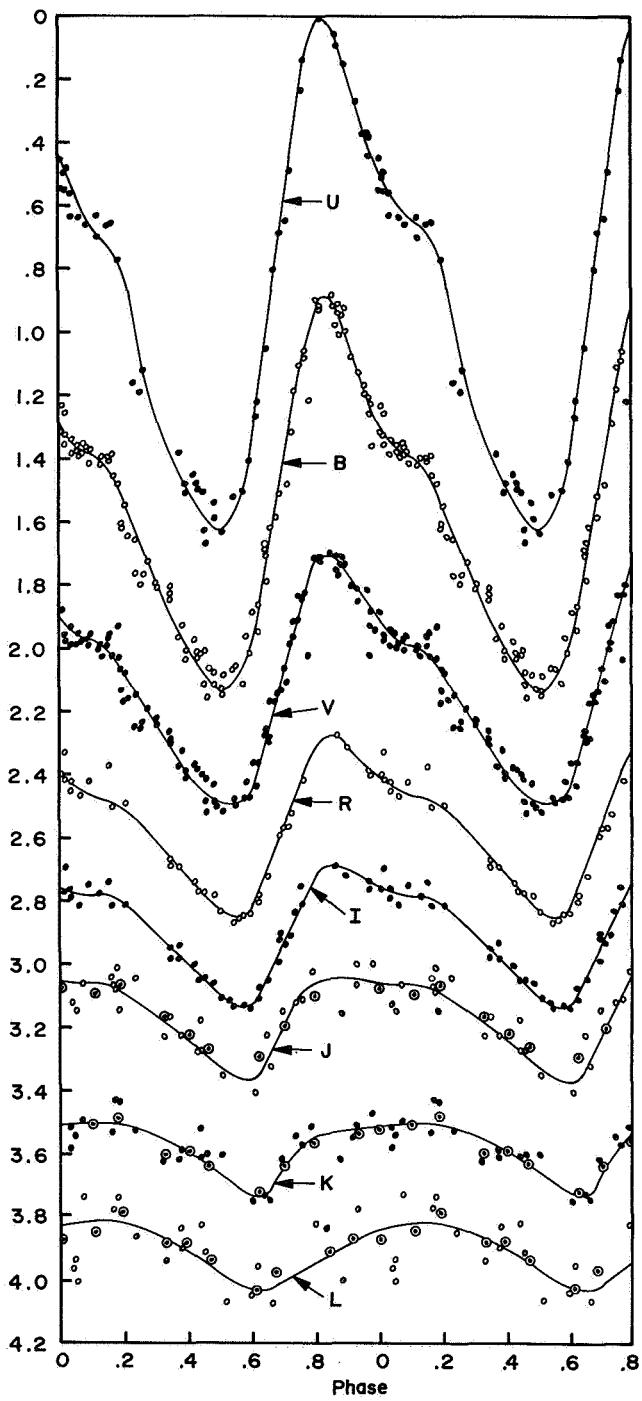
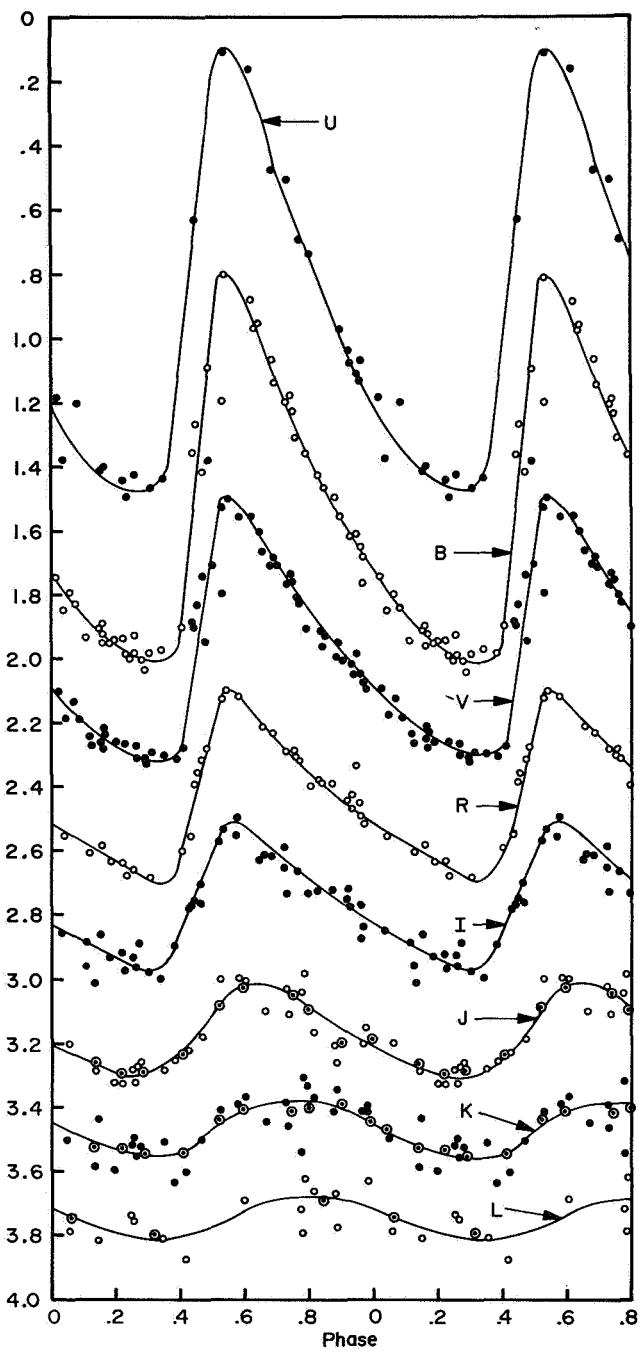
Fig. 3 The light curves for  $\eta$  Aql.

Fig. 4 The light curves for RT Aur.

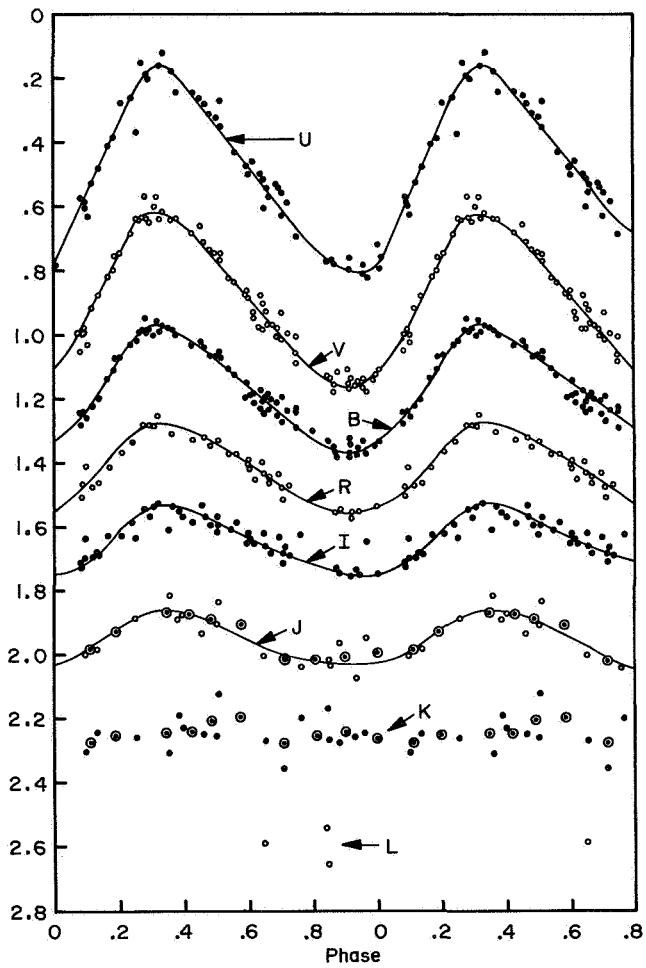


Fig. 5 The light curves for SU Cas.

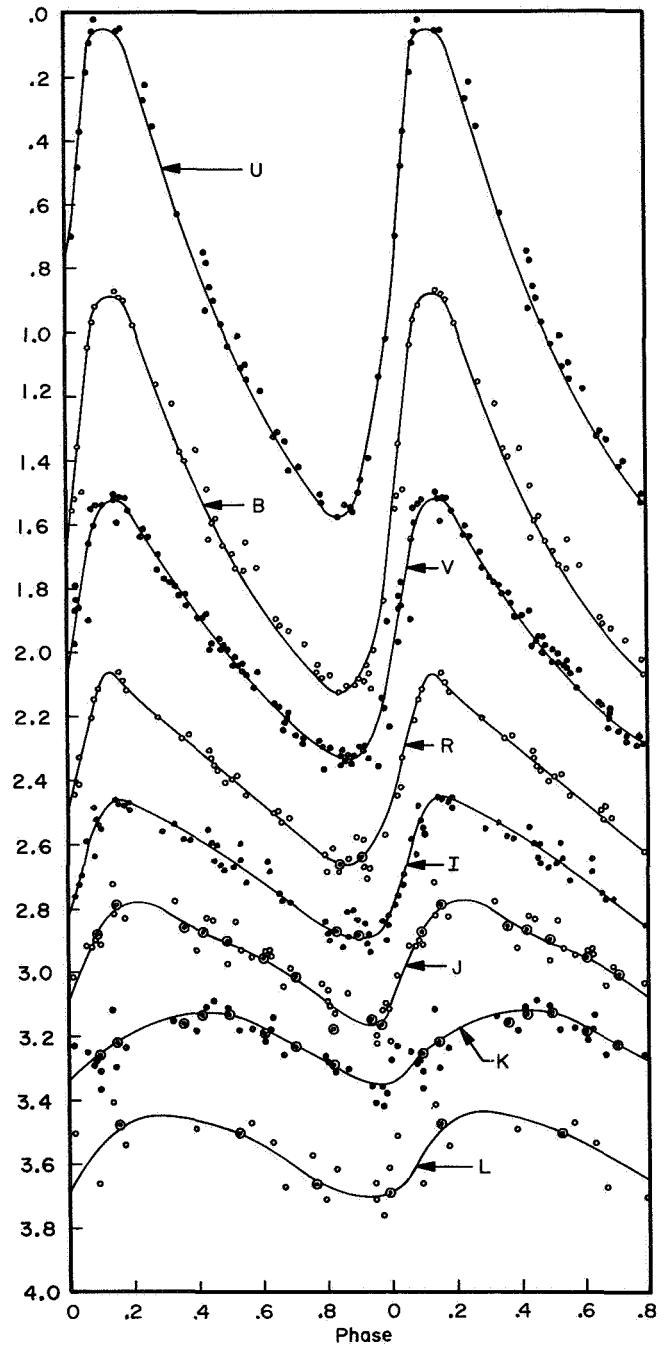


Fig. 6 The light curves for δ Cep.

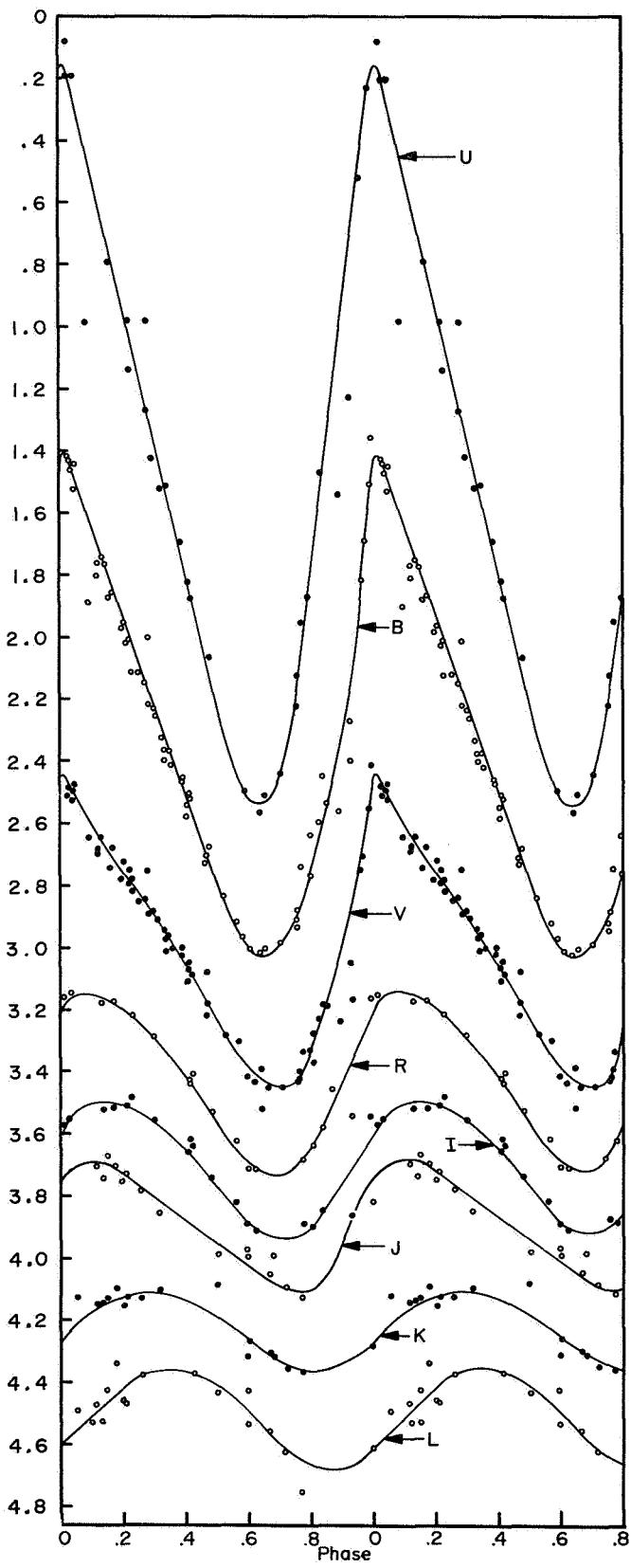


Fig. 7 The light curves for X Cyg.

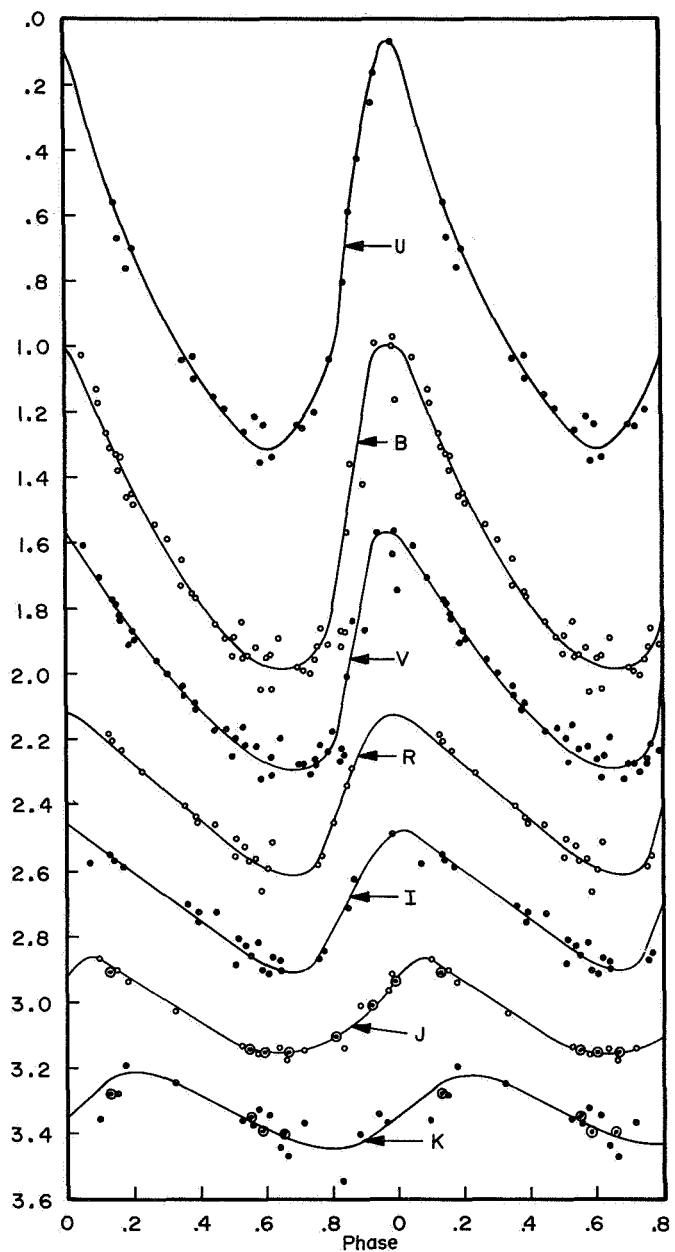


Fig. 8 The light curves for SU Cyg.

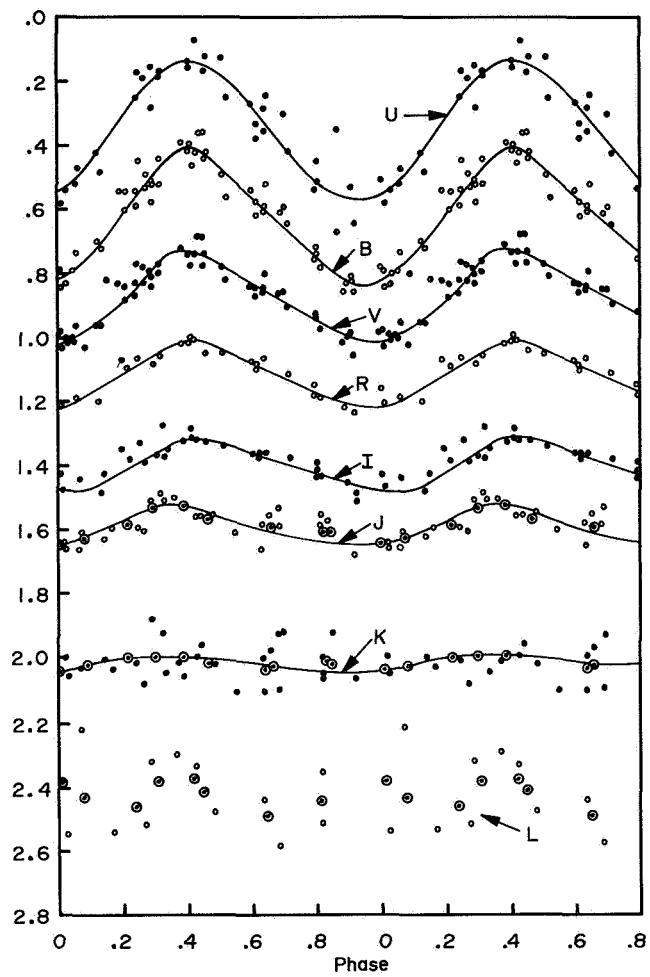


Fig. 9 The light curves for DT Cyg.

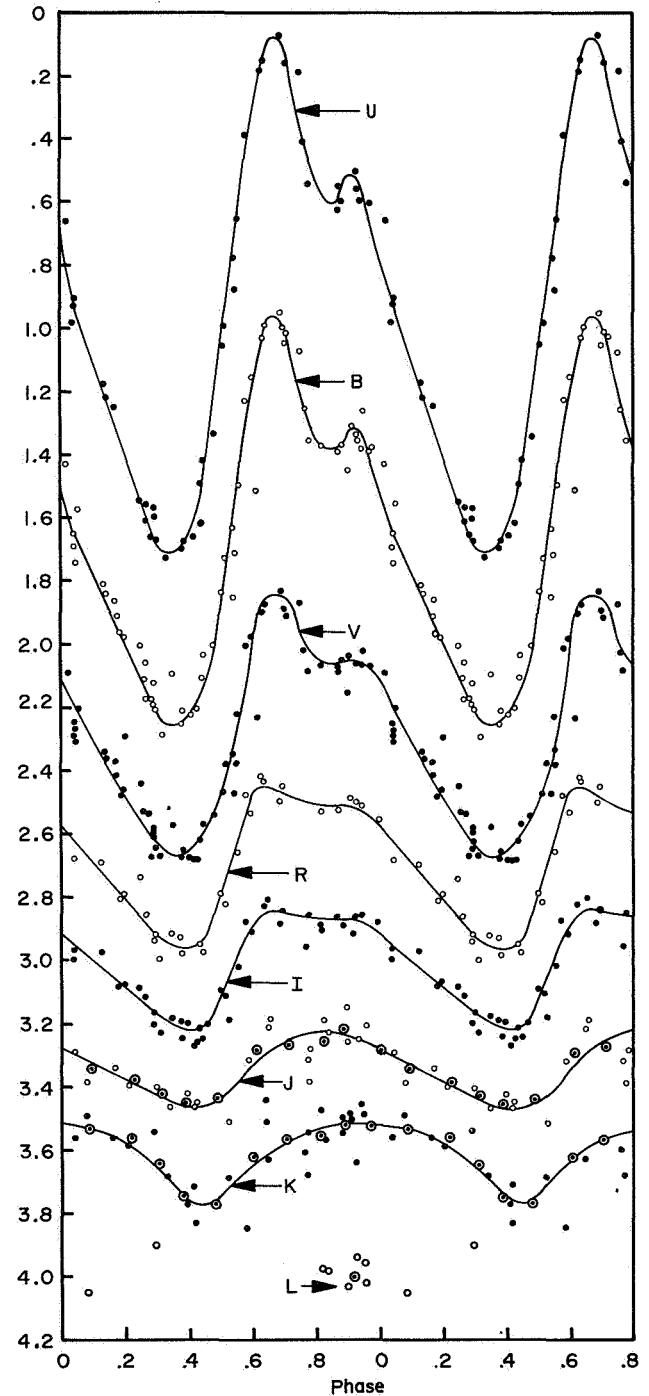


Fig. 10 The light curves for W Gem.

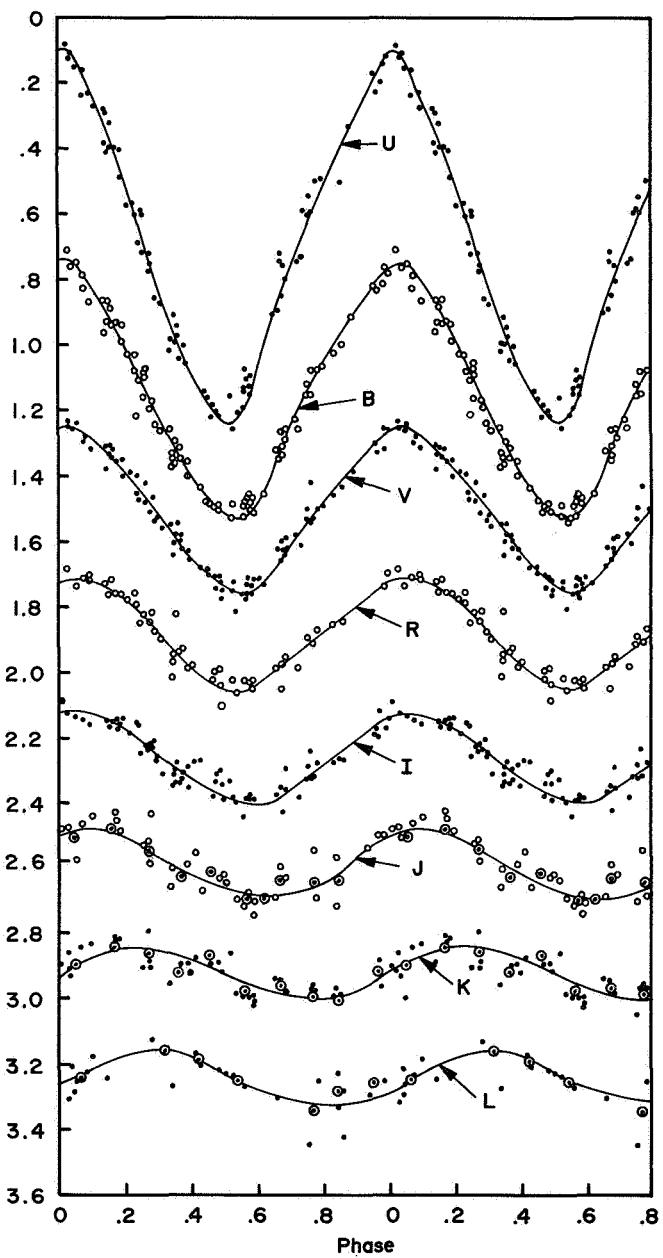
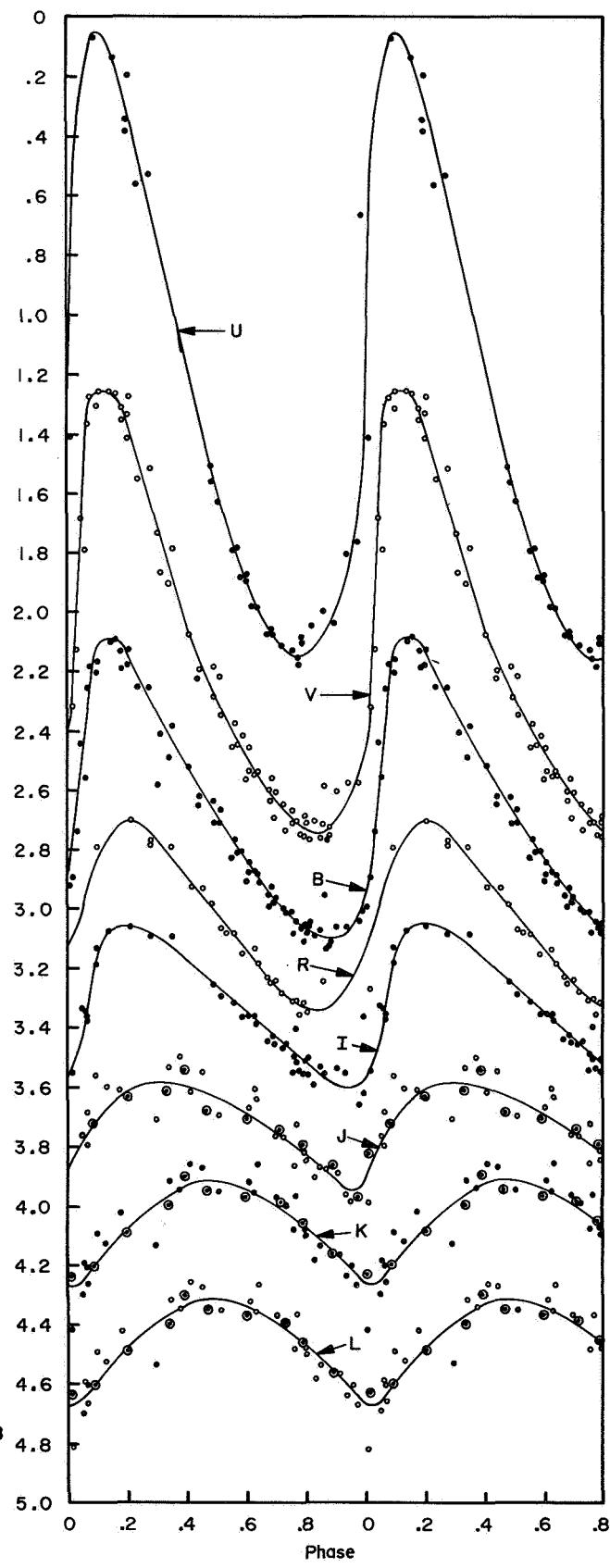
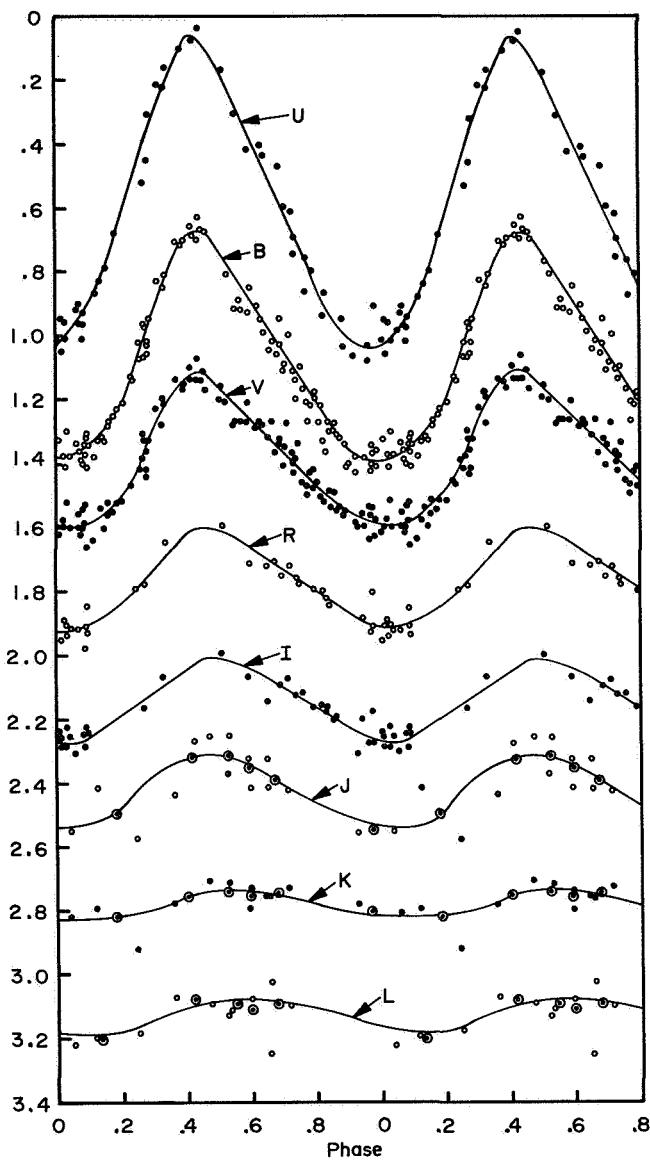
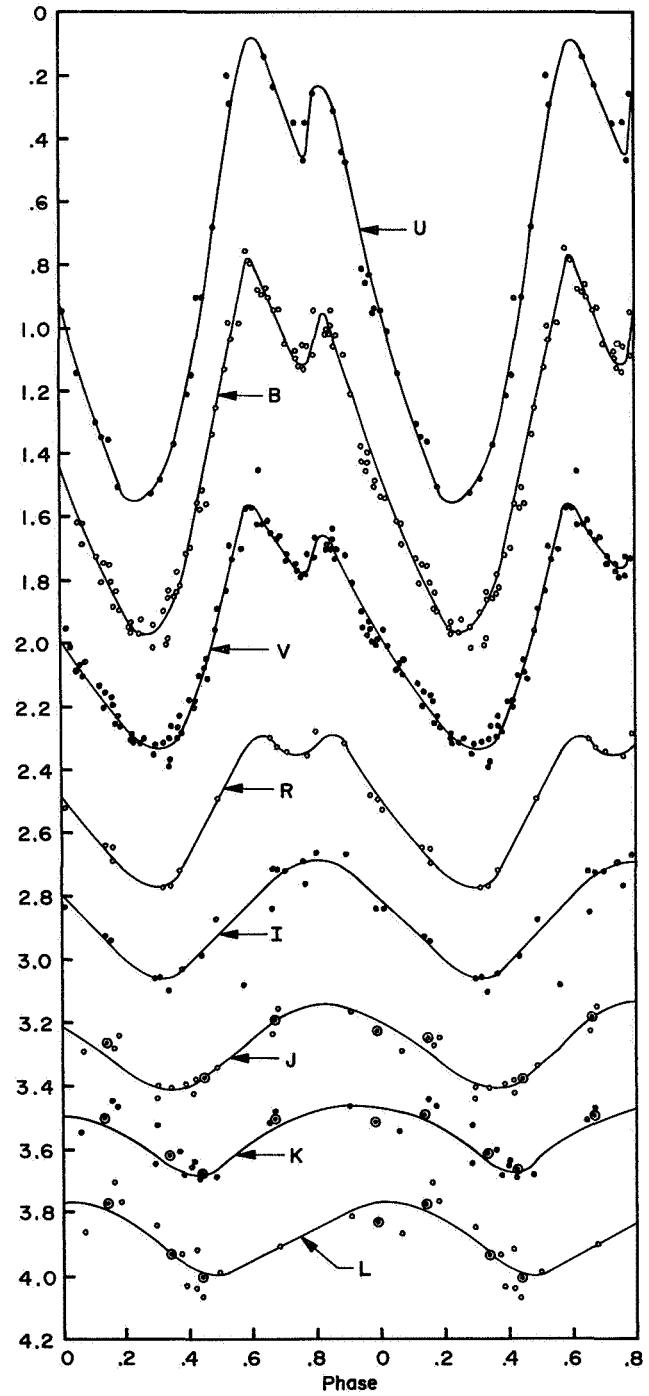
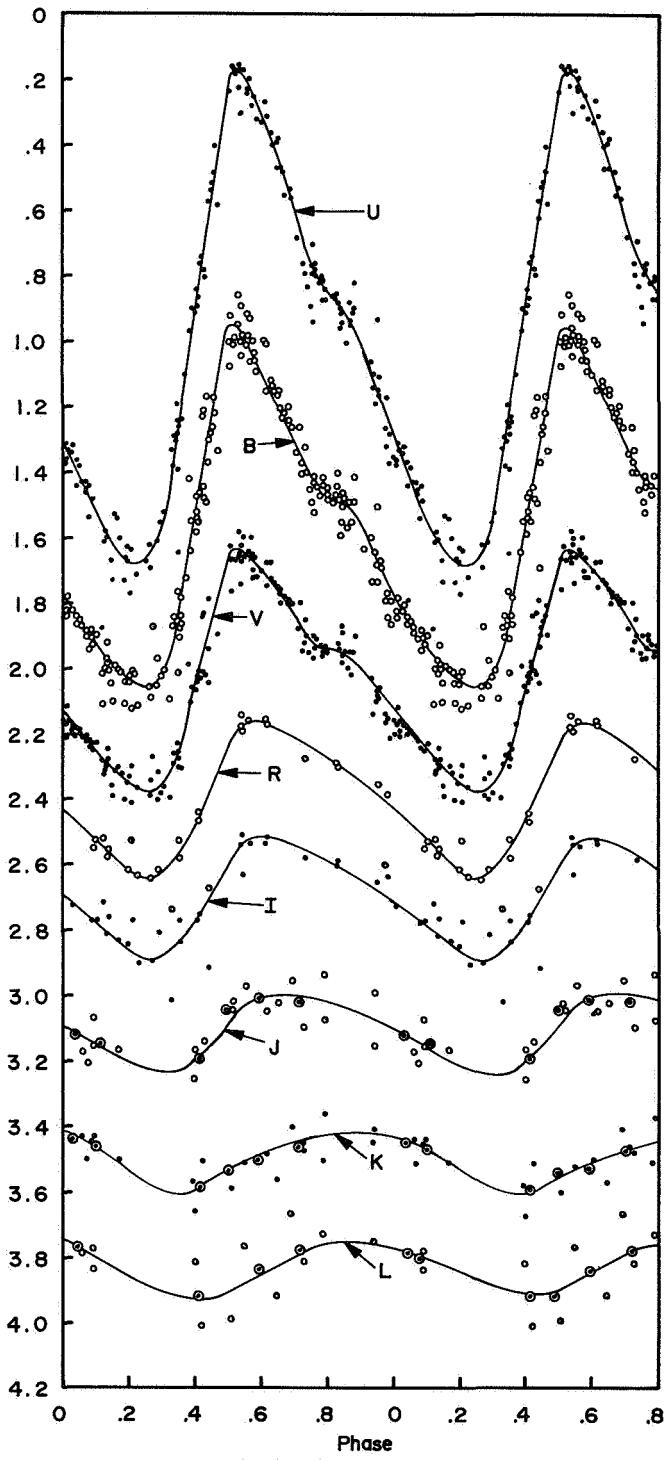
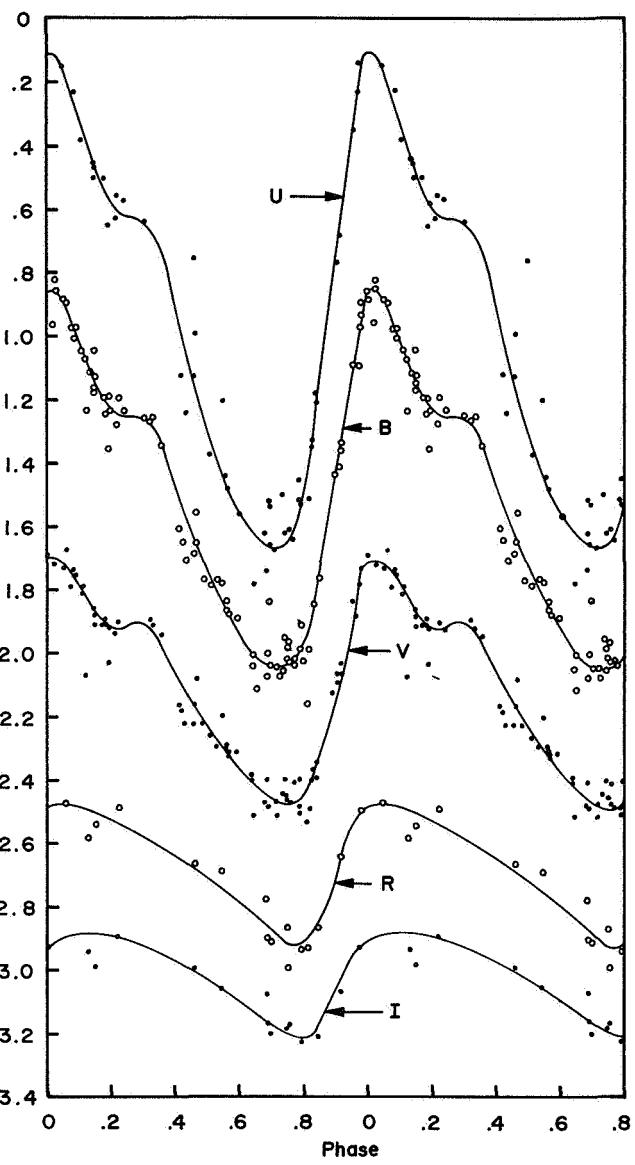
Fig. 11 The light curves for  $\xi$  Gem.

Fig. 12 The light curves for T Mon.

Fig. 13 The light curves for *Y Oph.*Fig. 14 The light curves for *S Sge.*

Fig. 15 The light curves for *U* Sgr.Fig. 16 The light curves for *W* Sgr.

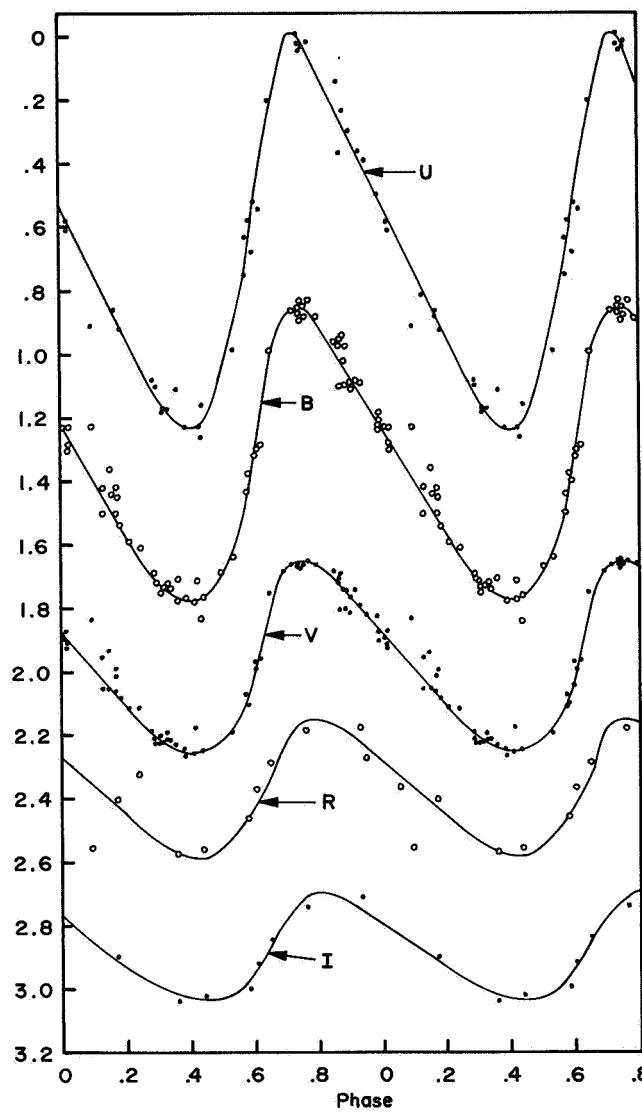


Fig. 17 The light curves for X Sgr.

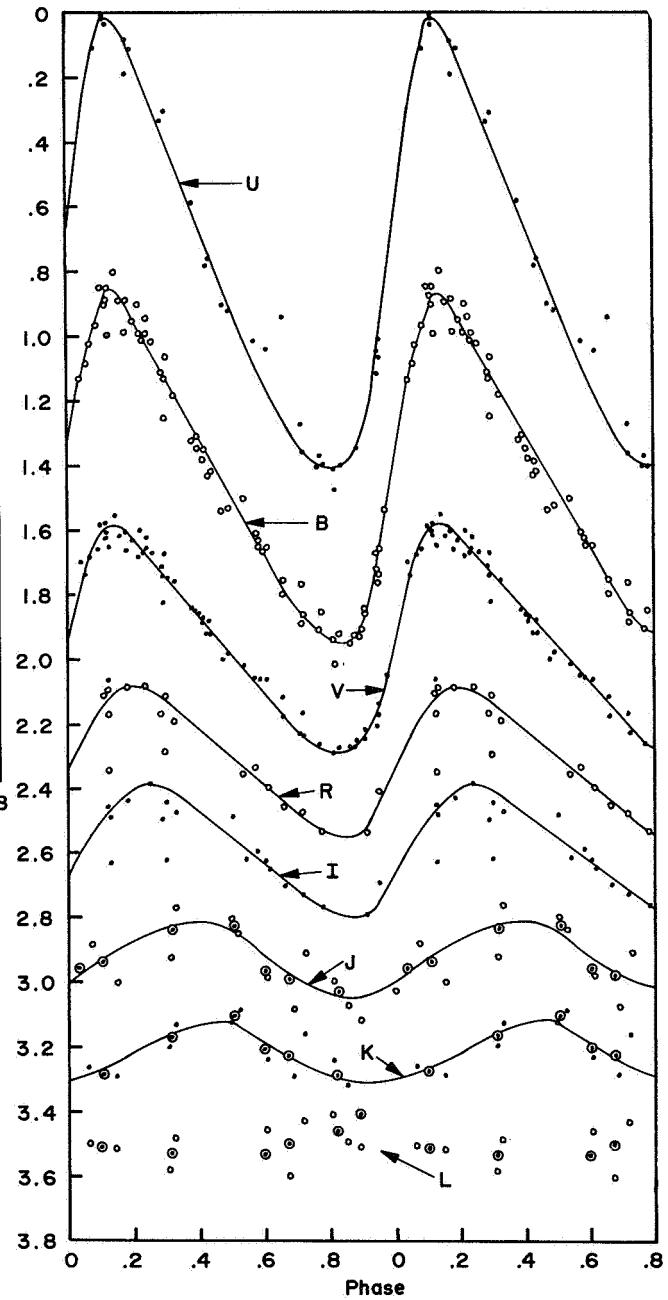


Fig. 18 The light curves for Y Sgr.

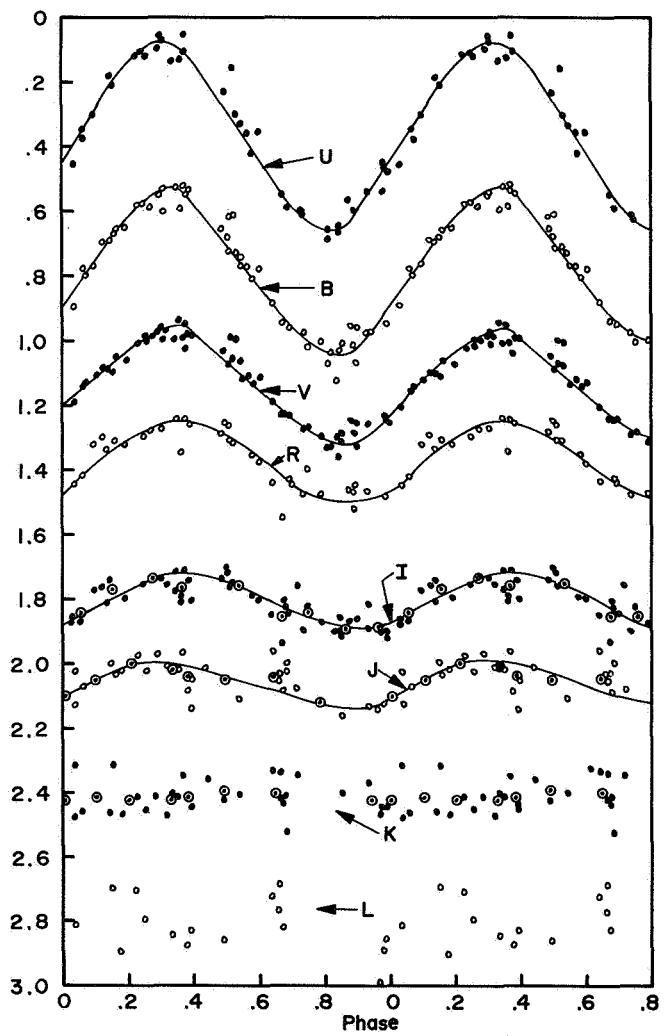


Fig. 19 The light curves for SZ Tau.

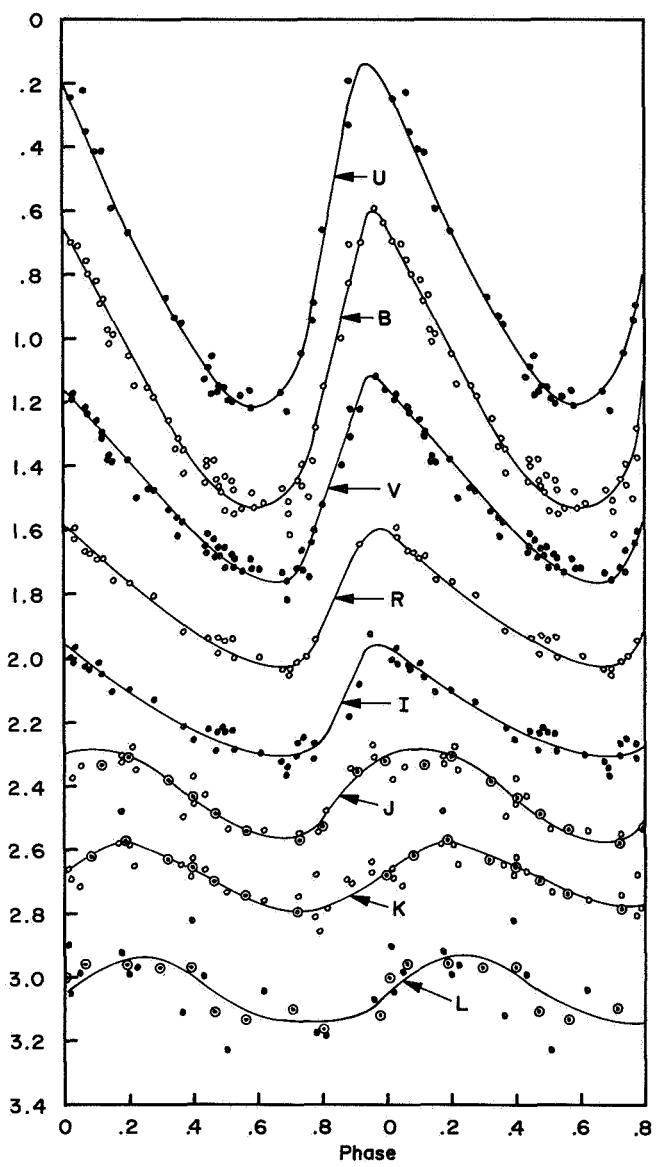


Fig. 20 The light curves for T Vul.

TABLE I A  
UBVRI CEPHEID MAGNITUDES

JD2430000+	V	B	U	R	I	JD2430000+	V	B	U	R	I			
U AQL					FF AQL					FF AQL				
88658.6819	6.209	7.140	5.462	4.850	9028.6638	5.284	6.017	6.554	4.707	4.228	4.258	4.268	4.258	
88674.6014	6.314	7.337	5.500	4.844	9029.6093	5.414	6.215	6.769	4.737	4.039	3.039	3.039	3.039	
88675.6604	6.385	7.465	5.530	4.852	9035.6264	5.432	6.212	6.780	4.813	4.268	3.540	3.540	3.540	
88676.6531	6.570	7.755	5.678	4.963	9037.6249	5.284	6.003	6.532	4.664	4.199	3.077	3.077	3.077	
88679.6402	6.299	7.245	5.469	4.848	9038.6398	5.447	6.276	6.855	4.785	4.287	3.123	3.123	3.123	
8930.9055	6.839	8.070	9.002	5.869	5.156	9040.5978	5.366	6.120	6.641	4.718	4.289	4.289	4.289	
8932.8651	6.131	6.998	7.593	5.399	4.799	9041.5968	5.188	5.847	6.350	4.614	4.161	4.161	4.161	
9028.6748	6.742	7.949	8.878	5.832	5.090	9042.6010	5.361	6.129	6.676	4.736	4.221	4.221	4.221	
9035.6406	6.719	7.960	8.887	5.801	5.055	9045.6055	5.194	5.882	6.389	4.613	4.165	4.165	4.165	
9038.6497	6.102	6.956	7.563	5.362	4.757	9066.5908	5.501	6.311	6.784	4.310	4.292	4.292	4.292	
9040.6079	6.353	7.392	8.146	5.500	4.849	9068.5770	5.218	5.919	5.955	4.139	2.634	2.634	2.634	
9041.6180	6.563	7.714	8.554	5.672	4.959	9069.5591	5.423	6.189	6.782	4.740	4.250	4.250	4.250	
9042.6246	6.696	7.911	8.844	5.770	5.039	9281.8972	5.374	6.134	6.666	4.798	4.305	4.305	4.305	
9045.6161	6.092	6.933	7.538	5.337	4.749	9376.6646	5.204	5.896	6.617	4.183	4.183	4.183	4.183	
9066.5975	6.055	6.901	5.324	4.756	5.367	9377.6422	5.367	6.121	6.733	4.292	4.292	4.292	4.292	
9068.5827	6.332	7.363	5.466	4.786	ETA AQL					3.092	2.634	2.634	2.634	
9069.5654	6.544	7.682	8.520	5.638	4.948	8209.8687	3.616	4.412	4.871	3.092	2.634	2.634	2.634	
9281.9046	6.784	8.006	5.858	5.163	ETA AQL					3.092	2.634	2.634	2.634	
9377.6500	6.355	7.466	5.500	4.889	8496.9658	3.727	4.459	4.940	3.103	2.664	2.664	2.664	2.664	
FF AQL					8506.9990	4.177	5.171	5.885	3.395	2.883	2.883	2.883	2.883	
7592.6268	5.228	5.898	6.413	4.804	4.296	8515.9797	4.233	5.143	5.769	3.504	3.012	3.012	3.012	
8658.6745	5.484	6.319	4.804	4.337	4.337	8518.9789	3.789	4.585	5.129	3.123	2.691	2.691	2.691	
8659.6973	5.476	6.309	4.821	4.179	4.179	8522.9687	4.274	5.222	5.903	3.540	3.039	3.039	3.039	
8670.6167	5.275	5.969	4.675	4.222	4.222	8526.9639	3.766	4.603	5.160	3.077	2.641	2.641	2.641	
8678.6268	5.309	6.037	4.680	4.222	4.222	8536.9699	4.278	5.267	6.017	3.571	3.036	3.036	3.036	
9000.7069	5.251	5.992	4.646	4.204	4.204	8655.6994	3.756	4.575	5.123	3.123	2.652	2.652	2.652	

TABLE 1A UBVRI CEPHEID MAGNITUDES

	JD2430000+	V	B	U	R	I	JD2430000+	V	B	U	R	I
ETA AQL												
8658.7072	4.294	5.330			3.534	3.007	8367.8963	5.331	5.869	6.225	4.858	4.552
8670.6227	3.824	4.657			3.204	2.714	8368.7729	5.181	5.665	6.069	4.728	4.415
8681.6113	3.876	4.641			3.268	2.829	8369.7750	5.548	6.267	6.750	4.941	4.543
8699.5909	3.882	4.750			3.196	2.713	8370.7686	5.764	6.542	7.041	5.136	4.726
8712.5934	3.762	4.527	5.051	3.119	2.672		8408.8685	5.402	5.961	6.247	4.884	4.573
8724.5963	3.934	4.718	5.184	3.295	2.825		8410.8084	5.563	6.231	6.612	4.980	4.578
8910.9235	4.096	4.990	5.551	3.427	2.949		8468.6707				4.777	
8930.9173	4.225	5.232	5.999	3.475	2.952		8469.6837				4.788	
8931.8919	4.282	5.317	6.001	3.547	3.029		8658.9837	5.031	5.410		4.627	4.374
8932.8867	3.903	4.685	5.143	3.270	2.841		8676.9376	5.804	6.575	7.034	5.200	4.802
9028.6986	3.787	4.593	5.135	3.172	2.715		8679.9793	5.714	6.497		5.083	4.667
9031.6825	4.236	5.283	6.042	3.484	2.961		8682.9863	5.556	6.279		4.957	4.574
9035.6659	3.734	4.538	5.060	3.153	2.658		8723.9125	5.492	6.213	6.711	4.833	4.557
9038.6687	4.215	5.211	6.007	3.473	2.943		9037.9928	5.769	6.556		5.135	4.734
9040.6247	3.783	4.519	4.992	3.224	2.809		9041.9010	5.790	6.590	7.090	5.179	4.774
9041.6380	3.508	4.114	4.555	2.980	2.588		9045.8966	5.791	6.587	7.067	5.185	4.782
9042.6447	3.684	4.433	4.952	3.104	2.659		9067.0111	5.597	6.360		5.018	4.636
9045.6350	4.173	5.180	5.948	3.446	2.905		9098.9560	5.001	5.408	5.709	4.600	4.332
9066.6104	4.090	5.048	5.048	3.373	2.850		9100.8293	5.684	6.453	6.972	5.052	4.659
9068.5948	4.160	5.063	5.714	3.476	2.972		9148.6948	5.497	6.170		4.887	4.527
							RT AUR					
9069.5795	3.644	4.288	4.739	3.123	2.715		9148.8872	5.551	6.250		4.978	4.580
9281.9181	4.067	5.012	5.012	3.390	2.879		9150.7660	5.388	5.945	6.282	4.921	4.598
9377.6637	3.942	4.718	3.942	3.295	2.895		9151.6763	5.209	5.697			
							9151.8503	5.268	5.813		4.786	4.455
							9154.6134	5.241	5.723		4.814	4.506
7668.7426	5.513	6.212	6.640	4.974	4.555		9159.5902	5.411	6.037		4.896	4.535
8108.6994	5.496	6.216	6.677	4.924	4.525		9159.7156	5.467	6.053		4.887	4.509

TABLE 1A UBVRI CEPHEID MAGNITUDES

	JD2430000+	V	B	U	R	I	RT AUR			V	B	U	R	I
							SU CASS			SU CASS				
9173.6665	5.059	5.456	4.622	4.358	9035.8059	5.784	6.440	6.880	5.207	4.738				
9174.6128	5.414	6.059	4.879	4.528	9036.7865	6.160	6.976	7.478	5.456	4.924				
9175.6856	5.772	6.581	5.104	4.691	9037.8815	5.831	6.485	6.943	5.231	4.787				
9177.6800	5.164	5.622	4.711	4.430	9038.8309	6.181	6.966	7.491	5.465	4.955				
9178.6649	6.343	7.148	5.579	4.869	9041.8546	5.835	6.511	6.979	5.226	4.768				
9468.9180	5.327	5.908	6.286	4.814	4.471	9042.7274	6.173	6.958	7.463	5.471	4.954			
						9045.9346	5.924	6.639	7.130	5.276	4.790			
						9066.6829	5.869	6.547	6.978	5.267	4.822			
						9068.6999	5.830	6.483	6.962	5.226	4.780			
7592.7799	6.040	6.786	7.293	5.316	4.834									
7597.7843	5.986	6.723	7.236											
8367.6409	5.995	6.681	7.171	5.309	4.847	9069.6397	6.034	6.796	7.289	5.375	4.882			
8367.7442	6.007	6.706	7.215	5.335	4.859	9098.7681	6.031	6.768	7.268	5.365	4.877			
8368.6558	6.037	6.732	7.236	5.368	4.885	9099.5872	6.040	6.802	7.279	5.407	4.922			
						9100.5889	5.944	6.662		5.299	4.821			
8369.6007	6.005	6.698	7.212	5.308	4.826	9100.8023	6.071	6.815	7.326	5.379	4.878			
8370.6416	6.008	6.682	7.183	5.365	4.886									
8371.5817	5.983	6.729	7.160	5.355	4.847	9154.6046	5.803	6.402		5.186	4.735			
8408.6634	5.977	6.681	7.199	5.299	4.819	9159.6148	6.182	6.920		5.450	4.940			
8410.7360	5.991	6.729	7.246	5.415	4.906	9159.7329	6.174	6.957		5.452	4.945			
						9173.6595	6.077	6.853		5.376	4.912			
8658.8733	6.145	6.929	7.420	5.438	4.946									
8674.7998	5.938	6.623	7.111	5.315	4.827									
8680.8546	5.784	6.436	5.184	4.744		7592.7544	4.327	5.204	5.851	3.580	3.145			
8682.8851	5.756	6.373	5.153	4.724		8368.5873	3.958	4.670	5.196	3.362	2.971			
8700.7914	5.865	6.544	7.021	5.237	4.769	8369.5924	4.161	4.986	5.625	3.482	3.053			
						8370.6230	4.356	5.236	5.877	3.686	3.239			
8720.6548	6.050	6.806	7.238	5.337	4.830	8371.5731	4.004	4.652	5.088	3.451	3.068			
9004.9639	5.902	6.626	5.274	4.808										
9028.9927	6.167	6.981	5.460	4.929										
9031.7725	5.786	6.451	6.899	5.185	4.770	8408.5811	4.338	5.190	5.817	3.595	3.155			

TABLE 1A UBVRI CEPHEID MAGNITUDES

	JD2430000+	V	B	U	R	I	JD2430000+	V	B	U	R	I
	DEL CEP						DEL CEP					
8410•5580	3•691	4•257	4•655	3•204	2•865	9151•5804	3•824	4•493	3•267	2•893		
8655•7872	4•183	4•936	5•420	3•571	3•167	9154•5697	4•324	5•172	3•711	3•246		
8677•7534	3•655	4•136	4•498	3•209	2•895	9159•5829	4•342	5•203	3•661	3•204		
8679•7104	3•877	4•581	5•581	3•309	2•905	9377•8025	4•016	4•831	3•388	2•959		
8699•6627	3•521	3•967	3•075	2•780		X CYG						
8722•7145	3•973	4•688	5•156	3•360	2•911	8224•8599	6•449	7•560	8•424	5•644	5•063	
8724•5809	4•372	5•277	5•211	3•691	3•211	8555•8999	6•047	7•039	5•278	4•717		
8931•9296	3•987	4•744	5•234	3•335	2•956	8655•7359	6•181	7•307	5•320	4•676		
8939•9428	4•340	5•220	5•758	3•668	3•245	8658•7384	6•469	7•835	5•524	4•854		
9004•8617	3•973	4•612	5•002	3•426	3•039	8678•6542	6•837	8•302	5•815	5•111		
9028•7674	3•991	4•762	5•272	3•412	2•986	8681•6250	6•676	7•925	5•740	5•094		
9031•7304	3•865	4•453	4•833	3•331	3•006	9028•7435	5•950	6•806	7•428	5•265	4•743	
9035•7694	4•296	5•175	5•812	3•640	3•161	9031•6999	6•078	7•154	7•989	5•276	4•716	
9036•7625	4•197	4•953	5•444	3•567	3•153	9035•7137	6•448	7•798	9•022	5•539	4•815	
9037•8003	3•516	3•982	4•356	3•092	2•786	9038•6985	6•816	8•261	9•694	5•813	5•088	
9038•8064	3•824	4•467	4•932	3•269	2•888	9041•6568	6•738	8•028	9•151	5•785	5•088	
9041•8197	4•313	5•179	5•768	3•674	3•223	9042•6946	6•581	7•740	8•668	5•684	5•047	
9042•7142	3•600	4•060	4•397	3•152	2•844	9066•6360	6•286	7•525	8•618	5•386	4•753	
9045•7989	4•170	5•013	5•615	3•530	3•085	9068•6099	6•484	7•810	9•075	5•503	4•833	
9066•6752	4•058	4•839	5•408	3•451	3•028	9069•5940	6•573	7•972	9•268	5•630	4•937	
9068•6651	4•322	5•140	5•772	3•628	3•190	SU CYG						
9069•6164	3•540	4•010	4•362	3•116	2•818							
9098•6612	4•038	4•786	5•339	3•389	2•981	8655•6922	7•119	7•761		6•554	6•146	
9099•5943	4•196	5•030	5•642	3•520	3•092	8658•6951	7•137	7•844		6•570	6•158	
9100•5823	4•347	5•233	5•882	3•649	3•198	8681•6058	7•098	7•785		6•504	6•104	
9148•5866	4•299	5•167	5•621	3•172	*	8931•8811	7•226	7•951	8•255	6•633	6•203	
9150•5828	3•518	3•989	3•124	2•799		8932•8768	6•914	7•467	7•703	6•340	6•012	

TABLE 1A UBVRI CEPHEID MAGNITUDES

	JD2430000+	V	B	U	R	I	JD2430000+	V	B	U	R	I
	SU CYG	SU CYG	SU CYG	SU CYG	SU CYG	SU CYG	DT CYG	DT CYG	DT CYG	DT CYG	DT CYG	DT CYG
9028.6890	7.165	7.814	8.095	6.586	6.169	9004.8495	5.905	6.530	5.421	5.049	5.242	4.928
9031.6728	7.122	7.848	8.159	6.523	6.129	9028.7547	5.675	6.141	6.468	5.335	5.015	4.969
9035.6550	7.126	7.821	8.116	6.563	6.113	9029.6199	5.841	6.416	6.749	5.265	4.927	4.927
9038.6596	6.971	7.631	7.938	6.401	6.003	9031.7213	5.752	6.306	6.654	5.259	4.969	4.969
9040.6175	6.745	7.260	7.488	6.284	5.919	9035.7407	5.668	6.147	6.468	5.197	4.888	4.888
9041.6293	6.662	7.167	7.449	6.183	5.853	9038.6297	5.645	6.115	6.435	5.370	4.967	4.967
9042.6346	6.990	7.655	7.929	6.437	6.029	9041.6071	5.739	6.241	6.570	5.360	5.032	5.032
9045.6260	6.734	7.279	7.563	6.230	5.883	9042.6149	5.885	6.479	6.805	5.387	5.042	5.042
9066.6039	7.153	7.843	7.153	6.511	6.162	9042.7627	5.861	6.437	6.771	5.288	4.978	4.978
9068.5885	6.677	7.201	6.194	5.859	5.194	9066.6501	5.745	6.276	6.629	5.281	4.950	4.950
9069.5732	7.009	7.665	8.000	6.451	6.052	9068.6258	5.636	6.097	6.453	5.209	4.916	4.916
9100.5489	7.074	7.745	8.050	6.458	6.029	9069.6100	5.830	6.439	6.811	5.378	5.038	5.038
9281.9125	7.163	7.851	7.851	6.593	6.219	9099.5797	5.832	6.453	6.835	5.347	5.000	5.000
9377.6574	7.149	7.844	6.557	6.184	6.184	9100.5763	5.733	6.238	6.567	5.281	4.976	4.976
						9375.7663	5.742	6.280	6.585	5.281	4.976	4.976
	DT CYG	DT CYG	DT CYG	DT CYG	DT CYG	DT CYG	DT CYG	DT CYG	DT CYG	DT CYG	DT CYG	DT CYG
8367.5879	5.960	6.557	6.942	5.434	5.117	8368.8595	6.767	7.673	8.305	6.316	5.708	5.708
8368.5787	5.661	6.134	6.475	5.250	4.974	8369.8063	7.077	8.022	8.684	6.352	5.719	5.719
8369.5760	5.802	6.346	6.737	5.298	4.968	8370.7063	7.232	8.359	9.257	6.427	5.796	5.796
8370.6080	5.862	6.402	6.722	5.398	5.086	8371.9069	7.375	8.509	9.392	6.286	5.696	5.696
8371.5626	5.681	6.194	6.426	5.245	4.942	8368.7806	7.375	8.132	8.756	6.286	5.696	5.696
8655.7499	5.744	6.247	5.288	4.983	4.983	8369.7819	7.173	8.132	8.756	6.286	5.696	5.696
8658.7580	5.674	6.159	5.212	4.926	4.926	8370.7769	6.598	7.330	7.882	5.914	5.427	5.427
8671.7442	5.771	6.321	5.293	4.970	4.970	8371.8747	7.269	8.333	9.115	6.474	5.847	5.847
8674.7451	5.873	6.481	5.383	5.036	5.036	8408.8171	6.527	7.244	7.778	5.993	5.485	5.485
8677.7323	5.876	6.490	5.401	5.067	5.067	8410.8171	6.527	7.244	7.778	5.993	5.485	5.485
8678.6657	5.621	6.091	5.216	4.927	4.927	8469.6773	6.773	7.244	7.778	5.993	5.576	5.576

TABLE Ia UBVRI CEPHEID MAGNITUDES

JD2430000+	V	B	U	R	I	W GEM	ZET GEM	JD2430000+	V	B	U	R	I
8658.9893	7.004	8.041	6.176	5.593		8143.6327	3.802	4.586	5.189	3.159	2.738		
8674.0277	6.761	7.671	8.294	6.009	5.460	8147.6229	4.136	5.075	5.827	3.448	3.007		
8676.9463	7.365	8.586		6.496	5.833	8367.9144	3.866	4.765	5.450	3.215	2.807		
8680.9553	6.763	7.670	9.248	6.024	5.490	8368.7934	4.014	4.939	5.735	3.320	2.890		
8723.9315	7.147	8.303		6.236	5.683	8369.7884	4.137	5.102	5.931	3.380	2.924		
9038.0023	6.759	7.650		5.995	5.459	8369.8951	4.107	5.082	5.898	3.372	2.894		
9041.9947	7.318	8.400	9.187	6.447	5.820	8370.7835	4.138	5.074	5.830	3.426	2.986		
9042.9506	6.921	7.790	8.353	6.152	5.620	8371.8949	4.030	4.932	5.417	3.449	3.023		
9045.9054	6.747	7.653	8.260	6.016	5.468	8376.9809	3.758	4.526	5.095	3.155	2.772		
9067.0170	6.680	7.453		6.029	5.509	8378.9056	3.992	4.941	5.672	3.338	2.896		
9098.9643	6.573	7.295	7.853	5.927	5.429	8379.9302	4.113	5.107	5.917	3.424	2.977		
9100.8361	6.775	7.685	8.324	6.020	5.463	8380.9785	4.118	5.064	5.772	3.445	3.007		
9148.6076	6.733	7.605		5.980	5.439	8381.8637	4.026	4.915	5.602	3.387	2.974		
9151.6586	7.310	8.484		6.432	5.799	8397.8254	3.798	4.624	5.267	3.154	2.753		
9154.8581	6.587	7.349		5.949	5.443	8431.7905	4.123	5.053	5.799	3.429	2.987		
9159.5985	7.343	8.499		6.416	5.769	8441.8147	4.179	5.088	5.842				
9174.5937	7.175	8.263		6.298	5.677	8443.8127	3.884	4.672	5.244	3.313	2.926		
9174.6323	7.165	8.274		6.293	5.676	8449.7746	4.005	4.940	5.692	3.367	2.938		
9175.8476	7.272	8.390		6.414	5.781	8461.7298	4.123	5.085	5.854	3.419	2.982		
9177.6875	6.709	7.523	8.090	5.973	5.474	8469.6901	3.958	4.856	5.571	3.297	2.910		
9468.9452	7.356	8.512	9.374	6.479	5.843	8480.6503	4.054	4.997	5.757	3.383	2.950		
8080.7593	3.672	4.379	4.815	3.094	2.745	8481.6745	4.172	5.060	5.796	3.488	3.060		
8108.7136	3.935	4.750	5.283	3.289	2.885	8482.6394	4.118	4.852	5.456	3.350	2.983		
8113.6326	3.855	4.677	5.301	3.189	2.761	8483.6307	3.992	4.060	5.095	3.114	2.957		
8142.6444	3.715	4.462	4.930	3.102	2.755	8498.6163	3.745	4.528			2.749		
8080.7593	3.672	4.379	4.815	3.094	2.745	8499.6307	3.877	4.757	5.415	3.218	2.828		
8109.6412	3.871	4.761	5.301	3.189	2.761	8509.6412	3.871	4.757	5.415	3.218	2.828		

TABLE 1A UBVRI CEPHEID MAGNITUDES

	JD2430000+	V	B	U	R	I	JD2430000+	V	B	U	R	I		
	ZET GEM							T MON						
8510.6310	4.043	4.968	5.715	3.413	2.944		8369.7682	6.581	8.004	9.260	5.491	4.783		
8658.9956	3.707	4.418	4.872	3.147	2.793		8370.7597	6.550	7.983	9.236	5.516	4.815		
8671.0208	3.780	4.554	5.082	3.126	2.746		8408.8598	5.626	6.568	7.332	4.907	4.364		
8675.0154	4.216	5.213	5.958	3.458	2.998		8410.8007	5.757	6.816	7.665	4.977	4.389		
8676.9584	4.014	4.856	5.445	3.389	2.984		8468.6659				5.122	4.505		
8678.0174	3.860	4.619		3.254	2.877		8469.6885				5.134	4.499		
8679.9853	3.632	4.307	4.783	3.080	2.729		8674.0204	6.394	7.614	8.549	5.470	4.851		
8699.8893	3.660	4.360	4.840	3.136	2.781		8682.9807	5.883	7.081		4.992	4.392		
8723.9389	3.946	4.903	5.696	3.217	2.876		8723.8714	6.454	7.878	9.130	5.442	4.854		
9038.0094	3.937	4.837	5.556	3.272	2.846		9037.9503	6.133	7.482	8.645	5.186	4.556		
9041.9104	3.995	4.857	5.441	3.378	2.960		9041.9846	6.383	7.828	9.125	5.384	4.688		
9042.9733	3.901	4.670	5.199	3.267	2.878		9042.9297	6.449	7.896	9.206	5.430	4.747		
9045.9242	3.696	4.423	4.935	3.110	2.743		9045.8878	6.567	8.045	9.315	5.552	4.847		
9067.0235	3.736	4.524	5.110	3.156	2.769		9067.0046	6.263	7.671	8.925	5.286	4.622		
9098.9710	3.929	4.839	5.554	3.279	2.857		9151.6998	6.459	7.900	9.210	5.445	4.756		
9129.9113	4.008	4.928	5.682	3.345	2.914		9154.6203	6.579	8.003		5.547	4.866		
9148.8413	3.790	4.622	5.274	3.177	2.785		9159.6618	6.504	7.780	8.805	5.561	4.928		
9151.7265	4.150	5.108	5.916	3.438	2.990		9173.7886	6.212	7.641	8.763	5.267	4.593		
9159.6697	3.912	4.788	5.473	3.245	2.837		9207.6478	6.539	7.999	9.288	5.507	4.819		
9174.6198	3.906	4.712	5.289	3.313	2.928		9391.9840	6.307	7.712	9.020	5.350	4.665		
9175.7333	3.835	4.591	5.204	3.241	2.865		9392.9952	6.376	7.843	9.115	5.337	4.666		
9177.6957	3.642	4.347	4.851	3.136	2.735		9470.9422	6.164	7.514					
						T MON				Y OPH				
8108.6928	5.705	6.603	7.204	4.993	4.492		8510.9334	6.401	7.873	9.110	5.116	4.151		
8367.8854	6.423	7.854	9.189	5.449	4.734		8518.9611	5.962	7.264	8.263	4.796	3.892		
8368.7660	6.500	7.942	9.247	5.247	4.750									

TABLE 1A UBVRI CEPHEID MAGNITUDES

	JD2430000+	V	B	U	R	I	JD2430000+	V	B	U	R	I
	Y OPH						S SGE					
8522.9370	6.186	7.599	8.784	4.959	4.017	8567.9187	5.885	6.910	5.186	4.992	4.533	
8526.9259	6.342	7.872	9.128	5.009	4.068	8658.7133	5.691	6.591	5.217	4.735	4.627	
8528.9382	6.385	7.863	9.065	5.045	4.120	8678.6477	5.932	6.880	5.138	4.986	4.567	
8658.6415	6.068	7.520	4.904	3.992	9028.7082	5.854	6.849	7.647	8.020	8.220	4.417	
8674.5898	6.011	7.351	4.911	3.961	9031.6912	5.589	6.362	4.986	4.820	4.820	4.362	
8676.6075	6.076	7.500	4.922	3.965	9035.6917	5.635	6.501	7.132	4.982	4.471	4.641	
8680.5731	6.359	7.882	5.080	4.098	9038.6778	6.013	7.006	7.774	5.272	5.272	4.756	
8937.7937	6.367	7.904	9.168	5.129	4.167	9041.6475	5.372	6.045	6.528	4.820	4.417	
8938.7725	6.393	7.911	9.152	5.136	4.177	9042.6546	5.363	6.055	6.554	4.779	4.362	
8939.7929	6.380	7.873	9.109	5.148	4.177	9045.6440	5.868	6.857	7.655	5.146	4.641	
9014.6245	5.916	7.178	4.947	3.998	9066.6160	5.350	6.003	4.795	4.416	4.416	4.361	
9018.6211	6.128	7.532	4.968	4.015	9068.6019	5.422	6.184	6.745	4.800	4.800	4.532	
9019.6119	6.138	7.598	5.127	4.144	9069.5869	5.653	6.640	7.245	5.017	5.017	4.417	
9025.6028	6.348	7.841	4.984	4.063	9100.5617	5.423	6.156	4.835	4.835	4.835	4.801	
9028.5984	6.106	7.465	4.984	4.063	9281.9236	6.008	6.940	5.263	5.263	5.263	4.801	
9029.5990	6.009	7.309	8.319	4.845	3.961	9377.6723	5.421	6.158	4.849	4.462	4.462	
9037.6136	6.221	7.693	8.892	4.988	4.056							
9038.6203	6.296	7.777	5.041	4.095								
9040.5873	6.342	7.846	9.125	5.114	4.167	8224.7839	6.724	7.838	8.591	8.839	5.169	
9041.5864	6.321	7.799	9.053	5.105	4.124	8510.9520	6.652	7.758	8.579	8.699	4.987	
9042.5909	6.343	7.810	9.036	5.112	4.144	8522.9600	6.375	7.298	7.967	5.562	4.934	
9175.0232	6.308	7.824	5.007	4.056	8526.9563	6.996	8.307	9.337	9.337	5.925	5.172	
9238.8901	6.082	7.414	8.398	5.043	4.184	8527.9563	7.000	8.311	9.345	9.345	5.925	
9246.9052	6.373	7.875	5.091	4.138	8528.9530	6.363	7.301	7.933	7.933	7.933	5.247	
9280.8805	6.420	7.824	9.109	5.150	4.138	8553.8769	7.048	8.342	9.368	6.013	6.013	
9281.8801	6.353	7.835	9.075	5.120	4.202	8559.9323	6.929	8.199	9.368	5.948	5.948	
9377.6031	6.122	7.547	4.917	4.039	8655.6464	7.020	8.270	8.270	8.270	8.270	5.208	

TABLE 1A UBVRI CEPHEID MAGNITUDES

	JD2430000+	V	B	U	R	I	JD2430000+	V	B	U	R	I
U SGR												
8658.6479	6.551	7.626	5.675	4.980	8526.9405	5.055	6.013	6.720	4.260	3.788		
8669.6075	6.975	8.205	9.088	5.980	8527.4583	5.135	6.156	6.990	4.328	3.838		
8677.5895	6.374	7.300	5.580	4.941	8655.6306	5.831	4.300	3.770				
8906.9058	6.323	7.266	7.870	5.553	8671.6038	4.996	5.905	6.558	4.331	3.843		
8908.8810	6.627	7.745	8.566	5.705	8937.8053	4.904	5.764	6.314	4.268	3.809		
8910.9126	6.975	8.272	9.281	5.979	8938.7835	4.386	4.974	5.331	3.891	3.531		
8931.8025	7.067	8.401	9.413	6.033	5.302	9000.6709	4.677	5.238	5.979	3.542		
9000.6893	6.745	7.799	6.077	5.314	9246.9245	4.798	5.770	6.305	4.086	3.659		
8937.8286	6.982	8.404	9.573	5.927	5.114	9264.9196	4.660	5.336	5.781	4.041	3.671	
8938.8073	7.088	8.383	9.388	6.043	5.296	9281.8668	4.451	5.049	5.570	3.946	3.491	
8939.8034	6.732	7.849	8.567	5.842	5.148	X SGR						
8940.7938	6.345	7.283	7.895	5.561	4.940	8186.8551	4.843	5.764	6.364	4.059	3.517	
9014.6370	6.458	7.374				8225.7898	4.500	5.235	5.695	3.876		
9018.6558	6.931	8.195				8517.9541	4.356	4.987	5.401	3.785	3.341	
9025.6229	6.947	8.219				8522.9254	4.827	5.707	6.310	4.067	3.541	
9246.9409	6.768	7.805	8.637	5.753	5.051	8526.9174	4.394	5.089	5.564	3.674	3.214	
9250.9233	6.438	7.344	7.999	5.592	5.032	W SGR						
9264.9378	6.376	7.304	8.008	5.568	4.915	8553.8437	4.247	4.832	5.216	3.684	3.239	
9280.8961	6.811	7.930	8.872	5.785	5.036	8940.7794	4.418	5.152	5.589	3.772	3.312	
9377.6281	7.095	8.388		6.135	5.417	9246.9145	4.567	5.317	5.724	3.867	3.423	
						9264.9076	4.610	5.418	6.078	3.901	3.398	
						9281.8550	4.700	5.375	5.881	3.960	3.495	
						9376.6049	4.436	5.229	6.108	4.059	3.622	
						Y SGR						
8161.9372	5.008	5.989	6.723	4.173	3.674							
8192.8496	5.070	6.035	6.714	4.390	3.866							
8205.8050	4.761	5.648	6.229	4.063	3.595							
8518.9701	5.084	6.035	6.757	4.303	3.806	8510.9430	5.403	6.086	6.582	4.787	4.340	
8522.9499	4.505	5.191	5.657	3.885	3.495	8518.9893	5.859	6.816	7.514	5.031	4.495	

TABLE 1A UBVRI CEPHEID MAGNITUDES

	JD2430000+	V	B	U	R	I	JD2430000+	V	B	U	R	I
	Y	SGR					SZ	TAU				
8526.9487	5.935	6.864	7.510	5.109	4.599		8408.7139	6.635	7.556	8.164	5.862	5.264
8528.9470	5.473	6.266	6.804	4.813	4.346		8410.7450	6.383	7.211	7.755	5.719	5.145
8553.8530	5.864	6.851	7.540	5.095	4.550		8469.6007	6.335	7.123	5.638	5.113	
8655.6366	5.422	6.145	7.048	4.780	4.286		8680.9496	6.578	7.485	5.836	5.252	
8682.5798	6.049	5.236	4.693	5.236	4.693		8681.8847	6.578	7.485	5.836	5.252	
8937.8161	5.376	6.061	6.509	4.810	4.360		8720.7431	6.628	7.549	8.065	5.880	5.318
8938.7946	5.518	6.317	6.832	4.866	4.398		9004.9885	6.379	7.183	5.674	5.125	
9018.6417	5.389	6.051	6.382	4.806	4.360		9029.0023	6.712	7.669	5.924	5.292	
9025.6135	5.559	6.382	6.959	4.889	4.377		9037.9406	6.666	7.575	8.208	5.876	5.294
9246.9327	5.917	6.959	6.453	5.156	4.609		9038.8753	6.597	7.494	8.056	5.846	5.263
9264.9293	6.237	7.054	7.902	5.230	4.670		9041.8766	6.632	7.539	8.135	5.876	5.294
9280.8893	5.819	6.706	7.052	5.052	4.520		9042.8577	6.389	7.138	7.654	5.671	5.129
9281.8877	5.968	6.970	7.775	5.174	4.631		9045.8444	6.382	7.176	7.706	5.695	5.149
9376.6429	5.450	6.199	6.453	4.866	4.389		9068.9302	6.524	7.403	8.013	5.752	5.185
9377.6198	5.626	6.453	6.453	4.988	4.525		9098.7845	6.538	7.379	7.943	5.818	5.234
							9099.7502	6.419	7.119	7.651	5.646	5.111
							9100.7552	6.618	7.555	8.187	5.824	5.244
							9148.5950	6.676	7.610	5.867	5.285	
							9151.5963	6.686	7.620	5.863	5.287	
							9154.5906	6.685	7.600	5.877	5.269	
							9154.7730	6.677	7.610	8.240	5.899	5.297
							9159.6218	6.374	7.137	5.657	5.136	
							9173.6508	6.751	7.649	5.884	5.299	
							9174.5797	6.487	7.293	5.737	5.207	
							9175.6699	6.425	7.256	5.722	5.189	
										5.687	5.137	

TABLE 1A UBVRI CEPHEID MAGNITUDES

JD2430000+	V	B	U	R	I	JD2430000+	V	B	U	R	I
SZ	TAU					T	VUL				
9175.7457	6.381	7.215	5.662	5.115		8711.5966	5.493	5.993	6.345	5.022	4.715
9177.6701	6.478	7.289	5.694	5.156		8720.6446	5.514	6.053	6.323	5.063	4.730
9392.9839	6.449	7.326	5.704	5.153		8930.9437	5.955	6.763	7.261	5.337	4.931
9468.8229	6.505	7.376	7.948	5.776	5.200	8931.9028	6.050	6.845	7.332	5.437	5.040
						9028.7321	5.989	6.771	7.295	5.396	4.984
						T	VUL				
8367.5777	5.985	6.741	7.268	5.386	4.986	9031.7102	5.683	6.352	6.769	5.158	4.800
8368.5712	6.072	6.818	7.338	5.448	5.056	9035.7276	5.555	6.117	6.509	5.089	4.715
8370.6005	5.688	6.282	6.691	5.155	4.805	9038.7088	5.904	6.581	6.994	5.346	4.964
8371.5549	5.871	6.647	7.051	5.315	4.913	9041.6797	5.914	6.681	7.191	5.338	4.924
8658.7462	5.595	6.188	5.087	4.751		9042.7037	6.035	6.768	7.266	5.434	5.023
						T	VUL				
8671.6882	5.475		4.995	4.669		9066.6429	5.537	6.097	6.450	5.068	4.732
8678.6597	6.023	6.812	5.397	4.998		9068.6182	5.976	6.736	7.290	5.329	4.921
8681.6380	5.778	6.483	5.202	4.831		9069.6037	5.962	6.697	7.144	5.396	4.952
						9099.5728	5.957	6.728	7.250	5.345	4.926
						9100.5705	6.020	6.745	7.412	5.412	5.003

TABLE 1B →  
(I)JKL CEPHEID MAGNITUDES

JD2430000+	I	J	K	L	JD2430000+	I	J	K	L
U AQL					ETA AQL				
8558.9134			4.060		9274.9144		2.467	2.009	1.829
8640.7446	4.425	3.785			9391.6713		2.527	2.128	2.040
8674.6673	4.405	3.758	3.592		9393.6762		2.367	1.945	1.838
8675.6679	4.439	3.783	3.726		9425.6410	2.836	2.526	1.987	1.893
8694.5708	4.308	3.826	3.774		RT AUR				
9041.6612	4.523	3.886	3.833		8339.9878	4.679	4.398	3.909	
9061.5864	4.338	3.784	3.694		8368.9258	4.392	4.229	3.882	
9062.5744	4.444	3.771	3.638		8370.9382	4.765	4.470	4.047	
9063.5659	4.553	3.891	3.718		8378.8221	4.699	4.450	4.130	
9064.5849	4.625	3.921	3.747		8379.8659	4.417	4.299	3.942	
9072.5876	4.507	3.940	3.744		8392.8312	4.818	4.481	4.081	
9273.8910	4.531	3.875	3.777		8396.7753		4.522	4.093	
9274.8930	4.669	3.998	3.803		8397.7844	4.569	4.380	3.997	
9391.6343	4.281	3.733	3.777		8398.7735	4.531	4.308	3.959	
9392.6317	4.458	3.925	3.804		8400.7883	4.690	4.458	4.025	
9393.6438	4.536	3.893	3.767		8431.7587	4.297	4.191	3.885	
9425.6213	4.751	4.397	3.863	3.808	8482.6141	4.735	4.525	4.035	
FF AQL					8739.9766		4.481	4.014	3.835
8320.6069	4.365	3.993	3.575		8740.9866		4.192	3.909	
8339.5961	4.132	3.874	3.492		8771.7779		4.178	3.802	3.890
8558.9086		3.959	3.490		9060.9738		4.479	4.004	3.905
8669.7056		3.979	3.543	3.443	9061.9030		4.205	3.862	3.787
8674.6570		3.906	3.506	3.216	9062.9350		4.405	3.909	3.865
8676.6587		3.949	3.480	3.403	9063.9466		4.454	3.931	3.910
8693.6376		3.931	3.440	3.331	9140.8533		4.233	4.039	3.817
9061.5744		3.945	3.430	3.359	9184.6745		4.640	4.103	4.040
9062.5649		3.970	3.449	3.371	9185.6337		4.175	3.831	3.719
9063.5535		3.768	3.363	3.249	9185.7326		4.364	3.863	3.761
9072.5727		3.817	3.388	3.275	9227.6561		4.396	3.995	3.886
9273.8856		3.900	3.482	3.364	9424.9489	4.700	4.350	3.905	3.731
9386.6196		3.795	3.355	3.168	9425.9892	4.728	4.518	3.990	3.850
9393.6363		3.880	3.522	3.460	9448.9695		4.426	4.009	3.977
ETA AQL					9461.8835		4.458	3.840	3.770
SU CAS									
8301.6618	2.655	2.411	1.969		8323.7783	4.897	4.594	4.198	
8494.9656	2.803	2.448	2.022		8323.8424	4.881	4.576	4.143	
8497.0069		2.299	1.874		8339.8759	4.808	4.406	4.203	
8521.9722	2.951	2.568	1.999		8343.8297	4.754	4.474	4.084	
8523.9773	2.735	2.422	1.943		8377.6057	4.867	4.610	4.251	
8558.9339		2.707	2.143	1.954	8378.6612	4.839	4.478	4.158	
8564.8931		2.473	1.921	1.822	8379.6509	4.822	4.630	4.093	
8669.6788		2.420	1.981	1.935	8395.5822	4.933	4.665	4.155	
8669.7280		2.447	1.942	2.005	8396.6114	4.732	4.527	4.145	
8670.6390		2.310	1.831	1.734	8397.5879	4.848	4.538	4.140	
8671.7247		2.523	2.022	1.934	8398.6431	4.797	4.421	4.017	
8675.6995		2.457	2.013	2.002	8400.5911	4.811	4.499	4.152	
8694.5840		2.648	2.201	2.065	8430.5729	4.941	4.555	4.167	
9035.6343		2.423	1.915	1.958	8431.5795	4.767	4.468	4.123	
9036.5885		2.367	1.932	1.768	8669.8854		4.590	4.167	3.983
9038.6010		2.569	2.008	1.916	DEL CEP				
9061.6463		2.620	2.141	2.071	8693.6708		4.622	4.163	4.049
9062.6081		2.320	1.915	1.818	8771.6360		4.615	4.066	3.935
9063.5981		2.298	1.908	1.768					
9064.6084		2.358	1.896	1.730					
9072.6070		2.446	1.835	1.780	8298.7316	2.823	2.643	2.187	
9273.9115		2.340	1.927	1.848	8315.7095	2.963	2.737	2.316	

JD2430000+	I	J	K	L	JD2430000+	I	J	K	L
DEL CEP									
8315.7769	2.990	2.734	2.283		9061.6266		5.735	5.246	5.292
8316.6708	3.155	2.838	2.362		9062.5843		5.862	5.327	
8316.7385	3.192	2.857	2.375		9063.5785		5.848	5.546	
8317.6758	3.201	2.919	2.523		9064.5969		5.570	5.361	
8317.7359	3.141	2.922	2.481		9072.5955		5.645	5.196	
8320.6477		2.732	2.277		9273.9033		5.837	5.359	5.131
8323.6380	2.849	2.702	2.375		9391.6540		5.610	5.281	5.239
8323.6879	2.856	2.717	2.466		9393.6600		5.885	5.473	5.452
8339.6656	2.947	2.718	2.393		9425.6314	5.785	5.620	5.359	5.320
8377.5957	2.765	2.620	2.398		DT CYG				
8378.5924	2.853	2.583	2.237		8340.6457	5.023	4.825	4.393	
8379.5877	2.902	2.639	2.236		8343.6182	4.950	4.707	4.447	
8395.5718	2.964	2.770	2.209		8377.5883	5.089	4.876	4.458	
8396.6036	3.053	2.793	2.317		8378.5852	4.878	4.683	4.317	
8397.5809	3.123	2.868	2.401		8556.8773		4.752	4.372	
8398.5921	2.899	2.719	2.351		8556.9648		4.729	4.315	
8400.5734	2.866	2.631	2.214		8557.9150		4.807	4.422	4.119
8638.8298		2.928	2.411	2.312	8564.8453		4.769	4.319	
8669.6715		2.756	2.282	2.169	8638.8156		4.757	4.357	
8741.6434		2.899	2.469	2.460	8640.8280		4.788	4.405	
8747.6220		2.694	2.409	2.360	8669.7465		4.894	4.457	
9061.7424		2.749	2.240	2.230	8674.7455		4.782	4.443	4.417
9062.6637		2.898	2.382	2.410	8676.7918		4.856	4.500	4.347
9063.6800		3.023	2.376	2.307	8725.6079		4.789	4.425	4.440
9064.6563		2.630	2.343	2.239	8738.6087		4.700	4.411	4.194
9072.6734		2.846	2.366	2.373	8741.5648		4.803	4.501	
9385.7720		2.813	2.328	2.204	9061.6947		4.780	4.396	4.351
9390.7904		3.000	2.441	2.366	9062.6561		4.842	4.391	
9424.6858	2.927	2.668	2.338	2.267	9063.6691		4.755	4.388	4.235
X CYG									
8558.9398		4.456	3.697		9064.6469		4.749	4.397	4.255
8646.8088		4.596	3.919		9072.6617		4.856	4.445	4.445
8671.7390		4.352	3.753	3.659	9385.7356		4.703	4.272	4.219
8676.6914		4.588	3.686	3.633	9391.7315		4.784	4.496	4.485
8694.5938		4.575	3.913	3.626	9393.7166		4.748	4.417	4.382
					9425.6838	4.987	4.802	4.481	4.419
W GEM									
9038.7372		4.597	3.864	3.731	8368.9403	5.798	5.322	4.860	
9040.7021		4.694	3.953	3.822	8370.9534	5.404	5.103	4.606	
9061.6680		4.421	3.883	3.809	8377.8760	5.784	5.403	4.781	
9062.6298		4.181	3.723	3.690	8378.8291	5.347	5.104	4.536	
9063.6429		4.303	3.741	3.670	8379.8743	5.459	5.279	4.776	
9064.6260		4.301	3.691	3.537	8392.8439	5.863	5.359	4.808	
9072.6458		4.656	3.902	3.758	8396.7818	5.519	4.600		
9385.7140		4.729	3.962	3.955	8397.8005	5.563	5.189	4.657	
9391.6990		4.340	3.739	3.726	8398.7797	5.894	5.236	4.653	
9393.6944		4.383	3.726	3.573	8400.7952	5.858	5.347	4.925	
9424.6542		4.272	3.730	3.627	8482.6536	5.569	5.212	4.698	
9425.6566	4.706	4.324	3.727	3.664	8483.6691	5.489	5.037	4.645	
SU CYG									
8320.6186	6.172	5.848	5.440		8692.9448		5.360	4.782	5.957
8558.9286			5.346		8771.7905		5.298	4.637	4.400
8671.7152		5.698	5.340	5.322	9060.9841		5.126	4.665	4.479
8674.7046		5.850	5.367	5.111	9061.9282		5.102	4.582	4.522
8675.6891		5.672	5.368		9062.9452		5.282	4.587	4.552
9035.6009		5.833	5.371	5.334	9063.9558		5.292	4.680	
9040.6874		5.717	5.407	5.353	9140.8635		5.146	4.736	4.440
					9185.6431		5.209	4.942	

JD2430000+	I	J	K	L	JD2430000+	I	J	K	L
W GEM					T MON				
9227.6650	5.151	4.594	4.536		8377.8585	4.641	4.263	3.695	
9391.9673	5.079	4.726			8378.8146	4.437	4.058	3.588	
9392.9622	5.170	4.642			8379.8573	4.371	4.100	3.621	
9424.9392	5.498	5.085	4.568	4.476	8392.8184	4.662	4.168	3.423	
9425.9980	5.491		4.547	4.461	8396.7695	4.853	4.360	3.580	
ZET GEM					8397.7733	4.857	4.315	3.587	
8315.9850	2.744	2.427	2.007		8398.7681	4.892	4.398	3.680	
8316.0243	2.742	2.451	2.023		8400.7809	4.844	4.387	3.668	
8316.9714	2.835	2.516	2.038		8431.7503	4.638	4.293	3.794	
8317.0089	2.817	2.576	1.991		8482.6236	4.852	4.457	3.735	
8317.9688	2.935	2.637	2.104		8483.6451	4.964	4.443	3.769	
8318.0047	2.925	2.645	2.092		8727.7924		4.480	3.914	3.851
8323.9943	2.775	2.550	2.149		8771.7690		4.136	3.362	3.184
8324.0213	2.796	2.518	2.150		9060.9626		4.030	3.417	3.364
8339.9957	2.995	2.693	2.181		9061.8903		3.995	3.443	3.324
8369.9408	2.903	2.628	2.090		9062.9266		4.109	3.361	3.230
8370.9809	2.982	2.701	2.206		9063.9380		4.040	3.371	3.318
8427.7765	2.755	2.482	2.017		9140.8397		4.204	3.633	3.458
8431.7674	2.980	2.683	2.192		9185.6210		4.478	3.702	3.718
8476.7744	2.686	2.480	2.097		9227.6445		4.193	3.449	3.306
8480.6207	2.888	2.587	2.090		9392.9523		4.107	3.458	3.327
8481.6629	2.941	2.624	2.115		9394.9570		4.258	3.473	3.356
8482.6369	2.981	2.745	2.221		9425.9784	4.839		3.634	3.439
8483.6173	2.891	2.633	2.183		9461.8766		4.103	3.518	3.440
8493.6179	2.948	2.592	2.141		Y OPH				
8494.6303	2.836	2.545	2.150		8320.5834	4.203	3.557	2.685	
8496.6733	2.718	2.503	2.080		8565.8297		3.582	2.821	2.583
8499.6014		2.526	2.103		8670.5926		3.439	2.679	2.469
8502.6192	3.040	2.716	2.193		8674.5856		3.422	2.698	2.477
8505.6383	2.865	2.616	2.189		8675.5930		3.422	2.663	2.424
8669.9720		2.575	2.128	2.086	8676.6106		3.430	2.634	2.395
8670.9810		2.560	2.086	2.040	9041.5812		3.556	2.729	2.623
8739.9608		2.539	2.028	2.089	9270.8512		3.282	2.651	
8740.9992		2.510	2.108	2.009	9272.8018		3.261	2.617	2.510
8771.7990		2.465	2.042	2.028	9273.8544		3.330	2.646	2.483
8773.8767		2.570	2.085	1.921	S SGE				
9036.0168		2.443	2.030	1.971	9274.8279		3.329	2.655	2.654
9060.9943		2.694	2.186	2.062	9385.5681		3.419	2.697	2.597
9061.9477		2.687	2.138	2.097	9391.5858		3.263	2.612	2.488
9062.9533		2.702	2.241	2.237	9392.5850		3.376	2.663	2.525
9063.9623		2.642	2.149	2.076	T MON				
9140.8735		2.662		1.998	8317.6449	4.753	4.419	3.733	
9185.6523		2.567	2.164	2.018	8320.6296	4.542	4.211	3.719	
9197.7443		2.477	2.056	2.107	8670.6514		4.358	3.863	3.836
9227.6715		2.502	2.160	2.049	8674.7281		4.144	3.675	3.607
9424.9578	2.872	2.550	2.068	1.964	8676.6287		4.262	3.653	3.498
9426.0066	2.930	2.642	2.058	2.031	9061.6556		4.272	3.756	3.658
9448.9877		2.688	2.171	2.044	9062.6200		4.223	3.676	3.560
9461.8899		2.573	2.199	2.052	9063.6070		4.387	3.853	3.640
T MON					9064.6139		4.405	3.854	3.709
8323.9793	4.676	4.294	3.762		9072.6198		4.386	3.819	3.732
8324.0146	4.650	4.181	3.700		9273.9241		4.373	3.893	3.829
8368.9097	4.761	4.263	3.492		9391.6795		4.365	3.903	3.863
8369.9562	4.704	4.222	3.469		9393.6842		4.133	3.691	3.699
8370.9112	4.811	4.347	3.597		9425.6477	4.572	4.320	3.897	3.787

JD2430000+	I	J	K	L	JD2430000+	I	J	K	L
<b>U SGR</b>									
8317.6193	5.232	4.667	3.998		8323.8918	5.211	4.930	4.265	
8320.5954	4.920	4.544	3.981		8343.8809	5.134	4.770	4.312	
8557.8656		4.575	3.991		8377.7290	5.257	4.826	4.216	
8558.8727		4.650	3.939	3.390	8378.7552	5.186	4.763	4.244	
8640.7060		4.706	3.999		8379.7380	5.205	4.825	4.303	
8667.5952		4.671	3.929	3.895	8396.6967	5.270	4.876	4.352	
8670.6240		4.543			8397.7430	5.205	4.939	4.343	
8674.5956		4.657	3.935	3.936	8398.6602	5.218	4.796	4.418	
8676.6231		4.754	4.160		8400.6519	5.149	4.809	4.368	
9256.8799		4.642	3.998	4.112	8430.6737	5.247	4.960	4.297	
9258.9403		4.597	3.965	3.917	8431.5977	5.134	4.796	4.354	
9272.8349		4.428	3.855	3.828	8480.6035	5.154	4.873	4.239	
9273.8656		4.491	3.901	3.851	8482.6039	5.172	4.821	4.310	
9274.8590		4.568	3.947	3.882	8674.9419		4.811		3.991
9298.8741		4.519	4.056	4.017	8727.7808		4.773	4.309	4.106
9385.6065		4.519	4.083	4.091	9060.9197		4.929	4.373	4.209
9391.6044		4.667	4.069	3.921	9069.7089		4.905	4.300	
9392.6029		4.468	4.004	3.871	9071.6463		4.837	4.207	4.092
9393.6028		4.450	3.896	3.763	9041.8690		4.901	4.338	4.252
<b>W SGR</b>									
8670.6038		3.515	2.844	2.805	9061.8476		4.807	4.298	4.239
9270.8629		3.505	2.984	2.881	9062.9185		4.887	4.324	4.213
9272.8198		3.343	3.001	2.966	9063.8461		4.938	4.374	4.395
9273.8493		3.130	2.835	2.699	9140.6975		4.887	4.272	
9274.8411		3.157	2.609	2.604	9185.5979		4.760	4.229	4.122
9274.8469		3.139	2.759	2.719	9185.6595		4.832	4.317	4.167
9391.5783		3.187	2.700	2.590	9391.9300		4.822	4.365	4.294
9393.5862		3.497	3.098	3.053	9392.9290		4.840	4.316	4.253
<b>X SGR</b>									
9270.8576		2.978	2.528	2.418	9424.9229	5.081	4.856	4.235	4.078
9272.8112		3.159	2.665	2.630	9425.9343	5.300	4.926	4.338	4.285
9273.8441		3.147	2.634	2.566	<b>T VUL</b>				
9386.5563		3.123	2.651	2.727	9461.8664		4.848	4.335	4.223
9391.5707		2.903	2.424	2.355	8320.6402	4.882	4.542	4.195	
9392.5716		3.154	2.616	2.547	8340.6327	4.954	4.568	4.176	
9393.5799		3.363	2.765	2.825	8377.5734	4.960	4.745	4.242	
<b>Y SGR</b>									
8339.5872	4.387				8378.5764	4.622	4.471	4.138	
8557.8550		4.123	3.602	3.682	8379.5718		4.505	3.978	
8564.8333		4.049	3.491		8395.5550	5.013	4.878	4.307	
8694.6081		4.228			8671.7583		4.538	4.216	4.086
9270.8690		4.200	3.644	3.507	8673.7882		4.726	4.230	4.324
9272.8280		4.206	3.694	3.617	8694.6251		4.472	4.082	4.081
9273.8602		3.969	3.531	3.584	9040.6751		4.545	4.142	4.068
9274.8522		4.006	3.528		9061.6798		4.513	4.176	4.170
9385.5953		4.287	3.696	3.702	9062.6483		4.520	4.079	4.022
9386.5994		4.270	3.723	3.591	9063.6590		4.649	4.128	3.912
9391.5943		4.113	3.566	3.529	9064.6379		4.733	4.254	4.139
9392.5937		4.324	3.813	3.610	9072.6539		4.624	4.162	4.092
9393.5949		4.084	3.666	3.601	9385.7252		4.165	4.002	
9425.5802	4.529	4.179	3.641	3.555	9391.7216		4.695	4.142	4.216
					9393.7082		4.678	4.281	4.277
					9424.6641		4.733	4.357	4.268
					9425.6738	4.707	4.574	4.190	4.150