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### FAR-ULTRAVIOLET STELLAR PHOTOMETRY: A FIELD IN ORION

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### ABSTRACT

Far-ultraviolet photometry for 625 objects in Orion is presented. These data were extracted from electrographic camera images obtained during sounding rocket flights in 1975 and 1982. The 1975 images were centered close to the belt of Orion while the 1982 images were centered  $\sim 9^{\circ}$  further north. One hundred and fifty stars fell in the overlapping region and were observed with both cameras. Sixty-eight percent of the objects were tentatively identified with known stars using the SIMBAD database while another 24% are blends of objects too close together to separate with our resolution. As in previous studies, the majority of the identified ultraviolet sources are early-type stars. However, there are a significant number for which no such identification was possible, and we suggest that these are interesting objects which should be further investigated. Seven stars were found which were bright in the ultraviolet but faint in the visible. We suggest that some of these are nearby white dwarfs.

Subject headings: open clusters and associations: individual (Orion Association) — stars: early-type — surveys — techniques: photometric — ultraviolet: stars — white dwarfs

#### 1. INTRODUCTION

Previous papers have reported results from an ongoing farultraviolet survey of various star fields (Carruthers & Page 1983, 1984a, b, c; Schmidt & Carruthers 1993, [hereafter Paper I]). The present paper presents data for a field in Orion.

#### 2. OBSERVATIONS

The data presented in this paper were extracted from five far-ultraviolet images, obtained by Naval Rescarch Laboratory electrographic cameras aboard NASA sounding rocket flights on 1975 December 6 (NASA Aerobee flight 13.118 DG) and on 1982 November 15 (flight 17.019 DG). The same images from the 1975 flight were used in a study of interstellar matter in Orion (Carruthers & Opal 1977a, b). The 1982 images were obtained on the same flight and with the same camera as the images in Monoceros discussed in Paper I. Information on the instrumentation is given in the previous papers but we plot the response functions in Figure 1 so they can be compared directly. The camera used in 1975 was sensitive from ~1230 to 2000 Å with an effective wavelength for flat photon flux distribution of 1519 Å. The camera used in 1982 was sensitive from ~1230 to 1650 Å with an effective wavelength of 1367 Å.

The two 1975 images analyzed here had exposure times of 30 and 100 s and were centered at  $\alpha_{1950} = 5^{h}35^{m}$ ,  $\delta_{1950} = -1^{\circ}36'$ . The 1982 images had exposure times of 9.5, 19.5, and 64.4 s and were centered at  $\alpha_{1950} = 5^{h}24^{m}$ ,  $\delta_{1950} = 7^{\circ}15'$ . With a field diameter of a little more than 20°, about one-half of the total field area was included in both sets of images. Figure 2 (Plate 8) shows a print of one frame from the 1982 field. Carruthers & Opal (1977a) published a print and contour plots of the 1975 field.

#### 3. THE REDUCTIONS

The reductions were carried out in exactly the same fashion and at the same time as the reductions for the study of Monoceros (Paper I); the details will not be repeated here. However, a few salient points will be mentioned. As noted previously, the star image diameters are not constant across the field and the FWHM ranges from  $\sim 2.5$  at the center to FWHM  $\sim 5'$  at the edge for the 1982 images. For the 1975 images the range is from  $\sim 3.0$  to  $\sim 6.7$ . The same correction curve for saturation and dependence of saturation on location was adopted for the 1982 images as previously but they were redetermined for the 1975 data. The change in the saturation magnitude from field center to edge for the 1975 data was 1.2 mag which is smaller than the value of 2.3 mag found for the 1982 data.

To transform the coordinates of the objects to the celestial coordinate system more than 110 objects were identified with SAO stars in each set of images. The coordinate fits had rms scatter ranging from 2/8 to 5/0. Photometric calibration was performed using stars from the *IUE* archives which were also among those identified with our objects. After deleting all stars identified in Table 1 as blends (see below), there were 51 stars available to calibrate the 1975 images and 41 for the 1982 images. The differences between our instrumental magnitudes and those derived by convolving *IUE* spectra with the response functions in Figure 1 had an rms scatter of 0.61 mag (1975 images) and 0.39 mag (1982 images). Given the number of calibrating stars our magnitude zero points have standard errors slightly less than 0.1 mag.

Magnitudes for a total of 625 objects were extracted. Of these, 175 were observed only in the 1367 Å band, 300 were observed only in the 1519 Å band, and 150 were observed in both bands. Table 1 lists the stars observed. The coordinates



FIG. 1.—Overall detection quantum efficiency as a function of wavelength for the electrographic Schmidt cameras used in this project based on laboratory measurements using the camera as a photodiode in comparison with an NBS-calibrated photodiode. The broader response function which extends to longer wavelengths is for the 1975 flight and the narrower function corresponds to the camera used in the 1982 flight.

determined from our frames are given in columns (2) and (3) while the ultraviolet magnitudes (on the same system as used in Paper 1) are in columns (4) and (5).

#### 4. STAR IDENTIFICATIONS

As before, we used the SIMBAD database to make optical identifications of as many objects as possible. These are listed in column (6) of Table 1. When more than one objects which might plausibly contribute to the ultraviolet flux fell within the camera's resolution we have indicated this by the word "Blend" in column (6). For 42 ultraviolet objects, no corresponding star was found in the SIMBAD database. Column (7) of Table 1 gives the magnitude of the identified star from the SIMBAD database. Most of these are V magnitudes but when only photographic magnitudes are present these have been listed followed by a P. In cases of blends, the combined magnitude is given. The spectral types from the database are listed in column (8). For blends the types of all the stars included in the magnitude are listed in the order of brightness.

#### 5. DISCUSSION

There are 94 stars in Table 1 which have a V magnitude attributed to a single star and both ultraviolet magnitudes. For these stars we formed the colors  $(m_{1367} - m_{1519})$ ,  $(m_{1367} - V)$ , and  $(m_{1519} - V)$ . Figure 3 presents plots of the first of these colors against the others. There were three deviant points which fell outside of the range of each plot. The solid lines have slopes calculated from the effective wavelengths using the approximate formula given by Sterken & Manfroid (1992) and zero points chosen to minimize the scatter (with a few discrepant points ignored). Although the adopted slopes are approximate, they provide a satisfactory fit. The rms scatter of the points about the lines is 0.275 and 0.321 for Figures 3a and 3b, respectively. This suggests that the errors of the ultraviolet

magnitudes are of the order of 0.2 mag which is consistent with the errors calculated for some of the same data in Paper 1 using a different method.

The consistency between our ultraviolet magnitudes and the V magnitudes demonstrated in Figure 3 shows that the majority of the identifications in Table 1 are correct. The stars which depart most from the trends (and fall outside the plots) are stars 143, 171, and 326. The first two of these have V magnitudes much too faint for their ultraviolet brightnesses. Additionally, star 171 is identified with an M4 star. These factors suggest that the ultraviolet sources have been mismatched with visible stars and the actual sources are not in the SIMBAD database. Star 326 has very uncertain ultraviolet photometry as indicated in a footnote to the table.

An examination of Table 1 shows that 428 objects (68% of the total) have been uniquely identified with known stars. An additional 147 (24%) are labeled as blends. In the following discussion we will be concerned mainly with the subsample for which we were able to obtain optical data from SIMBAD. We have omitted all the objects identified as blends or with star clusters. Ten stars were also omitted because they lacked either a V magnitude or a spectral subclass. The resulting *selected* sample contains 418 stars.

In Figure 4*a* and 4*b* we plot histograms of the frequency distributions of the full sample of stars and the selected sample for objects measured in each of the rocket flights. It can be seen that the selected sample distribution is very similar to that of the full sample; we will not introduce any bias by using it. It can also be seen that the limiting magnitude for the 1367 Å is at  $\sim m_{1367} = 8.5$  while the 1519 Å exposures reached  $\sim 1$  mag fainter.

In Figure 4c we plot the cumulative magnitudes for the two bands. The offset between the two curves is largely caused by the very bright 1519 Å magnitude of star 326. As noted above this is likely to be spurious. Aside from the offset, the two curves in Figure 4c are nearly the same shape. Both flatten out at a relatively bright magnitude compared with, for example, the corresponding plots in Paper I. This is due to the presence of a number of very bright, early-type stars in the Orion fields which contribute a significant fraction of the ultraviolet flux.

In Figure 5 we plot a histogram of the spectral types for stars in our selected sample. As in previous studies, the majority of the stars are closely clustered near spectral type A0. There are a few objects which are identified with later type stars. In this case, stars with spectral types of F0 and later make up 6% of the stars in Figure 5 while in the Monoceros field they made up 21% of the selected sample. It is likely that some of these late stars have hot companions which are the source of the ultraviolet radiation, while others are likely to be cases where the actual ultraviolet source is not identified in the visible. Both cases are likely to be interesting objects which should be pursued further.

Figure 6 shows the color-magnitude plots for the stars in the selected sample. These plots are similar to the corresponding plot in Paper I and the discussion there applies here. Again the effect of the limiting magnitude dominates the overall appearance of the plot. The scatter of the main group of stars is similar to that found in Monoceros which is consistent with the fact that the range of extinction is similar in the two fields (Sharov 1964).

TABLE 1 Objects Defected in the Ultraviolet

Note																							c	, U														
Sp. Type	F5	F8	A0 A0sn	B8 B8	B9	B9	Ä	G5 E5	K2,G0	AU	B8V Drif Doir	F3V,F8V	CA .	K5	B8V, B9V	A0V	K0,F8	AU	K0.G9	A8V	B8V	100		B8V		AIV		BgV	B8V,A3V	B8V,A2	B9	A0	B9Vn Er Astr	F 0, A 0 V K 0	A0V	B9V	Do	<b>B</b> 8
V	8.80	9.60	8.73 4.68	7.50	7.46	7.59	9.80	0.0P	7.99	8.60	7.51	10.17	0.40	9.60	7.40	8.31	8.14	01.7 8 20	89.8	10.60	8.70	04 0	0.0	10.10		9.10	0.00 7 70	7.80	7.71	8.26	9.03	7.91	6.67 r 90	0000	8.89	8.70	00 0	8.89
Identification	AG-01 504	AG+06 526	HD 32562 HD 32540	HD 32595	HD 32660	HD 32685	AG+45 495	HD 289876 1	Blend	AG+04 537	HD 32867	blend	AG+10 432	AG+03 583	Blend	SAO 131783	Blend	HD 33020	Rlend	AG+03 584	HD 33190	UD 22100	ROTCE /TU	AG-01 514		AG-01 516	HD 33403 HD 33368	HD 33431	Blend	Blend	HD 33590	HD 33610	HD 33647	ACTON SED	HD $33752$	HD 33766		AG+04 554
m <sub>1519</sub>	9.37 5.00	00.0					8.91	11.04		8.15	7.02	8.13	5.12	9.37	7.40	8.62			5 18	8.53	7.58	0 10	0.60	9.63	7.63		A.10	9.22	8.44	7.97	9.44	9.21	6.51	7.68	10.11	9.21		
<b>m</b> 1367		8.06	8.89 6.14	7.32	6.52	6.21	8.96		2.90	7.87	6.60	10 3	0.24		6.85		7.72	99.7 2.03	60.0			5.81	0.90			7.18	6.09 6.09	10.0	8.38				6.33	0.00			7.67	61.1
<b>b</b> 1950	- 1:29	- 3:1 / 6:44	12:31	13:09	8:46	7:23	1:46	0:44	7:07	4:28	2:35	- 3:44	10:00 - 4:54	3:41	2:23	- 3:33	4:57	10:41	- 5.20	3:07	- 2:27	14:50	- 1:52	- 1:42	- 6:42	- 1:29	20:2	- 4:02	- 1:50	- 5:22	- 5:46	- 6:15	0:28	60:0	- 0:36	- 3:09	6:17	4:39
<b>a</b> 1950	5:01:58	5:02:03	5:02:09 5.09-10	5:02:19	5:02:38	5:02:48	5:02:53	5:02:56	5:03:14	5:03:21	5:03:25	5:03:26	5-04-04	5:04:37	5:04:40	5:04:44	5:04:58	5:05:07	5-05-12	5:05:32	5:05:37	5:05:43	5:00:44	5:06:25	5:06:35	5:06:52	5:07:96	5:07:33	5:08:07	5:08:16	5:08:31	5:08:40	5:09:01	5:09:00	5:09:49	5:09:56	5:10:09 5.10.10	AT:AT:C
No.	46	4 48	49 50	515	52	53	54	55	56	57	28 28	59	00 19	62	63	64	65	66 67	589	69	2	58	22	75	22	92 1	2 2	62	8	81	82	83	<b>2</b>	60	82	8	68	90
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Sp. Type N	A0	B9,A0	B1II-III	A2 A1Vn	B2III+		B5V	F5	F5	B8		AlVn	AU B2III	K0.K0	A0,A,A0	A0V .	K2			Bg	G4,?	B7V, B6V	A0, B9 Vn, B9 Vn, B8	K0.K0.K0.G0	B9 Č	B8	G5,G0	Bev AITV	BR	<u>A0</u>	F5	B9	•	AU	<b>D</b> 0			
V Sp. Type N	6.70 A0	7.22 B9,A0	6.84 B1II-III 7 10 A3	4.37 A1Vn	3.70 B2III+		6.11 B5V	9.20 F5	9.90 F5	7.28 B8		6.61 AlVn	10.P AU	3.(2 D3111+ 7.53 K0.K0	6.64 A0,A,A0	4.65 A0V	9.3P K2		0.30 AUV 8 00 B0	6.00 D9 7.81 B9	10.24 G4,?	5.85 B7V,B6V	5.15 A0,B9Vn,B9Vn,B8 6.00 B0	7.9P K0.K0.K0.G0	6.81 B9	7.24 B8	7.94 G5,G0	6 00 BRV A1TV	7.19 B8	8.30 A0	0.00 F5	8.00 B9		7.59 AU	9.00 D8			13.75
Identification V Sp. Type N	HD 30365 6.70 A0	Blend 7.22 B9,A0	HD 30677 6.84 BIII-III HD 30714 7 10 A 3	HD 30/14 1.10 Az HD 30739 4.37 AIVn	HD 30836 3.70 B2III+	and strangers and strangers and	HD 30870 6.11 B5V	AG+05528 9.20 F5	AG+12 485 9.90 F5	HD 30989 7.28 B8		HD 31209 6.61 AIVn	HD 287192 10.P A0	Elend 7.53 K0.K0	Blend 6.64 A0.A.A0	HD $31295$ 4.65 A0V	HD 287193 9.3P K2	AG+12 489 10.00 A0	HLJ 31411 0.30 AUV	AG+05 549 5.00 D9 HD 31374 7.81 B9	Blend 10.24 G4,?	Blend 5.85 B7V,B6V	Blend 5.15 A0,B9Vn,B9Vn,B8 ACT 02 562 0 00 D0	Blend 7.9P K0.K0.K0.G0	HD 32021 6.81 B9	HD 32145 7.24 B8	Blend 7.94 G5,G0	Bland 6.00 B8V A1IV	HD 32202 7.19 B8	AG+01 519 8.30 A0	HD 287411 0.00 F5	HD 32359 8.00 B9	NGC 1753	HLD 32366 7.59 AU	AG+03 313 9.00 B8			G 97 -15 13.75
m <sub>1519</sub> Identification V Sp. Type N	HD 30365 6.70 A0	Blend 7.22 B9,A0	HD 30677 6.84 B1II-III	HD 30/14 (.10 AZ	HD 30836 3.70 B2III+			AG+05 528 9.20 F5	AG+12 485 9.90 F5	HD 30989 7.28 B8		HD 31209 6.61 AIVn	HD 287192 10.P A0 HD 31337 3 73 B3111	IID 31231 3.12 D3111+ Rlend 7.53 K0.K0	Blend 6.64 A0,A,A0	HD 31295 4.65 A0V	HD 287193 9.3P K2	AG+12 489 10.00 A0	HD 31411 0.50 AUV	AG+03 349 6.00 D9 HD 31374 7.81 B9	Blend 10.24 G4,?	Blend 5.85 B7V, B6V	Blend 5.15 A0,B9Vn,B9Vn,B8 o	Blend 7.9P K0.K0.K0.G0	HD 32021 6.81 B9		Blend 7.94 G5,G0	1.29 6.09 BeV A11V		7.40 AG+01 519 8.30 A0	HD 287411 0.00 F5	HD 32359 8.00 B9	7.98 NGC 1753		AG+03 3/3 9.00 BO			G 97 -15 13.75
m <sub>1367</sub> m <sub>1519</sub> Identification V Sp. Type N	7.00 — HD 30365 6.70 A0	7.00 6.58 Blend 7.22 B9,A0	5.52 HD 30677 6.84 BIII-III	7.88 HD 30714 1.10 Az 5.81 HD 30739 4.37 A1Vn	2.12 HD 30836 3.70 B2III+	6.76 6.76	5.45 HD 30870 6.11 B5V	5.27 AG+05 528 9.20 F5	7.55 - AG + 12 485 9.90 F5	8.31 HD 30989 7.28 B8	7.08 80.7	8.33 HD 31209 6.61 AIVn	9.43 HJJ 28/192 10.F AU	2.00 fil. 3123/ 3.12 D3111+ 7.50 Riend 7.53 K0.K0	7.81 Blend 6.64 A0.A.A0	7.11 HD 31295 4.65 A0V	6.09 HD 287193 9.3P K2	7.81 —— AG+12 489 10.00 A0	7.45 HD 31411 0.50 AUV	1.61 AG+U3 049 0.00 D9 8.16 HD 31374 7.81 B9	8.27 Blend 10.24 G4.?	6.10 Blend 5.85 B7V,B6V	5.59 Blend 5.15 A0, B9 Vn, B9 Vn, B8 C	1.69 AG+03.903 8.00 B9 10.39 Blend 7.9P K0.K0.K0.G0	8.47 HD 32021 6.81 B9	5.71 —— HD 32145 7.24 B8	8.17 Blend 7.94 G5,G0	E 20 E 77 Bland E 00 BeV AIIV	7.32 HD 32202 7.19 BR	6.77 7.40 AG+01 519 8.30 A0	7.18 HD 287411 0.00 F5	6.06 —— HD 32359 8.00 B9	7.98 NGC 1753	6.51 HD 32366 7.59 AU	7.49 - AG+U3 313 9.00 D8	6.73		5.57 G 97 -15 13.75
51960 m1367 m1519 Identification V Sp. Type N	5:48 7.00 — HD 30365 6.70 A0	6:43 7.00 $Blend$ 7.22 $B9,A0$	8:24 5.52 —— HD 30677 6.84 B1II-III	0:08 7.58 HD 30114 7.10 AZ 8.53 5.81 HD 30739 4.37 A1Vn	5:36 2.12 HD 30836 3.70 B2III+	10:19 6.76	9:57 5.45 HD 30870 6.11 B5V	5.25 $5.27$ AG+05 $528$ $9.20$ F5	12:52 7.55 AG+12 485 9.90 F5	12:21 8.31 —— HD 30989 7.28 B8	5:48 7.08	1:33 8.33 HD 31209 6.61 AIVn	12:35 9.43 HJ 28/192 10.P AU	2:20 2:00 HU 3123/ 3:12 D3111+ 7:10 7:50 Blend 7:53 K0.K0	11:59 7.81 Blend 6.64 A0.A.A0	10:05 7.11 HD 31295 4.65 A0V	12:41 6.09 HD 287193 9.3P K2	12:46 7.81 AG+12 489 10.00 A0	5:21 7.45 HJ 31411 0.50 AUV	5:09 1.51 AG+U3 349 5:00 D9 13:36 8.16 HD 31374 7.81 B9	0:33 8.27 Blend 10.24 G4.?	14:29 6.10 Blend 5.85 B7V, B6V	3:34 5.59 Blend 5.15 A0,B9Vn,B9Vn,B8 0	3:13 1.59 AG+03 303 8.00 B9 13:21 10.39 Blend 7.9P K0.K0.K0.G0	10:47 8.47 HD 32021 6.81 B9	3:39 5.71 —— HD 32145 7.24 B8	2:56 8.17 — Blend 7.94 G5,G0	1:52 7.29 1:50 E 20 E 77 Bland E 09 BRV AITV	11.13 7.32 HD 32202 7.19 B8	1:58 6.77 7.40 AG+01 519 8.30 A0	11:15 7.18 HD 287411 0.00 F5	3:24 6.06 HD 32359 8.00 B9	- 3:17 7.98 NGC 1753	9:13 6.51 —— HJJ 32366 7.59 AU	3:30 0.01 AG+U3 3/3 9.00 D0 0.98 7.49 AG+U3 3/3 9.00 D0	9.26 1.42	- 6:23 6.92	10:52 5.57 G 97 -15 13.75
α1950 δ1950 m1367 m1819 Identification V Sp. Type N	4:44:14 5:48 7.00 — HD 30365 6.70 A0	4:44:35 $6:43$ $7.00$ $$ $$ $   4:45:35 3:41 6.58  Blend 7.22 B9,A0$	4:47:17 8:24 5.52 —— HD 30677 6.84 BIII-III	4:4/:44 0:58 7.88 HD 30/14 1.10 AZ 4.47.55 8:53 5.81 HD 30739 4.37 A1Vn	4:46:18 5:36 2.12 HD 30836 3.70 B2III+	4:48:27 10:19 6.76	4:49:06 9:57 5.45 HD 30870 6.11 B5V	4:49:17 $5:25$ $5.27$ AG+05 $528$ $9.20$ F5	4.50:16 12:52 7.55 AG+12 485 9.90 F5	4:50:18 12:21 8.31 HD 30989 7.28 B8	4:50:18 5:48 7.08	4:50:48 1:33 8.33 HD 31209 6.61 A1Vn	4:51:03 12:35 9.43 HJ 28/192 10.P AU	4:01:18 2:20 2:00 HJ 31231 3.12 D3111+ 4.61.40 7.10 7.50 Blend 7.53 K0.K0	4:52:12 11:59 7.81 Blend 6:64 A0.A.A0	4:52:21 10:05 7.11 HD 31295 4.65 A0V	4:52:45 12:41 6.09 HD 287193 9.3P K2	4:53:02 12:46 7.81 AG+12 489 10.00 A0	4:53:15 5:21 7.45 HJ 31411 5.30 AUV	4:53:22 3:09 1.51 AG+03 349 5.00 D9 4:53:35 13:36 8.16 HD 31374 7.81 B9	4:56:10 0:33 8.27 Blend 10.24 G4,?	4:56:43 14:29 6.10 Blend 5.85 B7V,B6V	4:57:54 3:34 5.59 Blend 5.15 A0,B9Vn,B9Vn,B8 0	4:58:06 3:13 7.59 AG+03 303 6.00 B9 4:58:06 13:21 10.39 Blend 7.9P K0.K0.K0.G0	4:58:10 10:47 8.47 HD 32021 6.81 B9	4:58:28 3:39 5.71 — HD 32145 7.24 B8	4:58:38 2:56 8.17 <u>Blend</u> 7.94 G5,G0	4:58:51 1:52 7.28	4:00:01 1:00 0:05 0:11 Diction 0:02 DOV, ALIV	4:59:21 1:58 6.77 7.40 AG+01 519 8.30 A0	4:59:51 11:15 7.18 HD 287411 0.00 F5	5:00:10 3:24 6.06 —— HD 32359 8.00 B9	5:00:21 - 3:17 7.98 NGC 1753	5:00:29 9:13 6.51 HJJ 32366 7.59 AU	0:00:40 5:00 0.01 AG+US 013 9.00 D0 5.01:06 0:08 7.49 AG+US 013 9.00 D0	5:01:32 10:33 6.73		5:01:51 10:52 5.57 G 97 -15 13.75

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	Sp. Type	A0 B9	B8,A0 B0V	B8III,B9	B8 A7V	B9V	B3Vp B8V	BIV	B2IV-V,B3V B2V	G2IV		AIV,AUV BRV	A0	BIVn,BIV	B9 B0 A0 A9	A5		A0,B6V	A0,A0 Dov	BSV.ARV.A4V	B8V	B8III	B8	B1.5V	B3Vw.	B6.5IV-V	A0	M4	AZ R1 R0 5V	B5	B4IVn	B5V B1V=2	B1 Vpe B9,A0	B2III	K2
	4	9.10 7.21	7.75	6.27	8.41 10.60	11.00	11.7	5.79	4.35 7 06	10.50		9.54 8.30	6.74	4.24	8.35	10.0P		6.70	7.21	101.01	8.30	5.99	8.80	5.70	7.89	8.40	8.00	12.50	9.70	7.60	6.32	7.36	4.94 8.23	1.64	10.10
	Identification	HD 34814 HD 34827	Blend	Blend	AG+04 575 AG+16 464	HD 294005	HD 34959 HD 35008	HD 34989	Blend HD 25070	BD+14 891	-   	Blend AG+00 529	HD 35134	Blend	AG+00 532 Blond	HD 287767		Blend	Blend	Blend 400	HD 35271	HD 35281	HD 35258	HD 35299	HD 35298	HD 35305	HD 35320	V435 Ori	AG+03 035 Blend	HD 35349	HD 35407	HD 35502	nu 30439 Blend	HD35468	AG+12 548
	m1519	8.40 5.98	6.95	5.81	8.14	8.39	5.91 6 71		2.86 6.08	0.00	7.94	8.28	7.92	3.49	8.00	7.74		6.56	7.73	7.68	7.55	5.40	8.47	3.87	6.80	8.02	8.05	1.29	0.23		5.02	5.98	3.21 8.16	ļ	ļ
	<b>m</b> 1367		99 0	0.0	7.65	5.81	5.59 6 70	3.56	2.57 5 81	7.94		8.11	8.50	3.28	7.72	00.1	7.05	6.45	07 3	0.43 7.19	7.42		8.28	3.33	6.62	7.63		4.53	1 46	6.90	4.78	6.01 2.07	8.40	0.27	7.01
	<b>6</b> 1950	- 7:14 - 5:15	- 5:53	- 5:23	4:25 16:24	- 3:01	3:58	8:17	- 0:24 3.00	- 5:00 14:39	5:20	13:48 0-08	2:46	3:30	0:26	2:08	9:23	1:06	- 8:12 15.55	- 1:26	- 1:01	- 8:30	0:39	- 0:09	07:0T	0:52	-10:36	6:24	3:23	17:07	2:20	- 2:52	0:47	6:12	12:26
	<b>a</b> 1950	5:17:30 5:17:33	5:17:41	5:17:56	5:18:26 5:18:37	5:18:41	0:18:46 5-18-52	5:18:56	5:19:13 5:10:15	5:20:02	5:20:13	5-20-17	5:20:21	5:20:23	5:20:37	5:20:38	5:20:40	5:20:45	5:20:46	5:20:50	5:20:55	5:21:01	5:21:02	0:21:16	0.21:19	5:21:29	5:21:33	5:21:39	21:42	5:22:08	6:22:15	5:22:18 5:22:18	5:22:30	5:22:32	:22:33
	0	36		64	141	43	44	46	41	46	20	12	223	54	55	22	58	20 20	60 5	10	38	64	65		2 20	69	20	28	22	22	75	292	282	62	30
11.	<u> </u>										-				-		-					-		<u></u> -							-			-	<u> </u>
	Note					υ				υ		ç	ر			υ																			U
	Sp. Type Note	AOV	B9 Aor	B8V	B8V R8	, i	A5V A0	AV B8Iab:	B8V	B8 c B9V			AO	B8V	A0V	AJV,AZV C BRV	B8V	B9V	A0V	B9V,A0V B8	A0	B8V	F4III	AOV	Balli BEVI	B3V B10	A0,B8V,B9V,A3V	A2V,B9V	B9V,A5V,A5	R1.5V.R9V	B9	A3V	A3V A0		A0 c
	v Sp. Type Note	8.10 A0V 6.00 A5V	8.71 B9	9.80 AUV 7.60 B8V	9.30 B8V 7 34 B8		10.10 A5V 8 54 A0	0.12 B8Iab:	9.50 B8V	8.77 B8 c 7.30 B9V			7.70 A0	9.30 B8V	5.50 A0V	1.80 A5V,AZV C 8.60 B8V	7.78 B8V	8.92 B9V	6.42 A0V	8.38 B9V,ADV 7.60 B8	8.30 A0	9.30 B8V	10.90 F4III	9.05 A0V	3.59 B5111 7.20 BEV	8.70 B9	7.32 A0,B8V,B9V,A3V	7.10 A2V,B9V	B9V,A5V,A5	9.10 AU 6.23 B1.5V.B9V	7.86 B9	9.10 A3V	7.70 A3V 10.00 A0		8.82 A0 c
	Identification V Sp. Type Note	AG-00 591 8.10 A0V HD 23883 6.00 A5V	AG+04 556 8.71 B9	HD 33917 9.80 AUV HD 33928 7.60 B8V	HD 33975 9.30 B8V HD 32004		HD 293868 10.10 A5V PD 07 1000 8 54 A0	HD 34085 0.12 B8lab:	BD+00 992 9.50 B8V	AG+04 559 8.77 B8 HD 34054 7.30 B9V			HD 34149 7.70 A0	AG+00 514 9.30 B8V	HD 34203 5.50 A0V	Blend 1.80 A5V,A2V C HD 34307 8.60 B8V	HD 34280 7.78 B8V	HD 34342 8.92 B9V	HD 34317 6.42 A0V	Blend 8.38 B9V,ADV HD 2/228 7.60 B8	AG+13 436 8.30 A0	HD 34430 9.30 B8V	HD 290122 10.90 F4III	HD 34481 9.05 A0V	HU 34503 3.59 B5111 UD 94611 7.90 DEV	AG+05 596 8.70 B9	Blend 7.32 A0, B8V, B9V, A3V	Blend $7.10$ A2V, B9V	Blend B9V,A5V,A5	AGTUL 334 9.10 AU Blend 6.23 B1.5V.B9V	HD 34736 7.86 B9	AG-02 124 9.10 A3V	HD 34811 7.70 A3V BD-09 1124 10.00 A0		HD 34813 8.82 A0 c
	m <sub>1519</sub> Identification V Sp. Type Note	10.57 AG-00 591 8.10 A0V 0.56 HD 32883 6.00 A5V	9.29 AG+04.556 8.71 B9	10.54 HJ 33917 9.80 AUV 5.66 HD 33928 7.60 B8V	8.94 HD 33975 9.30 B8V 6.46 HD 33004		9.47 HD 293868 10.10 A5V 7.00 PD 07.1000 8.54 A.0	1.34 HD 34085 $0.12$ B81ab:	9.36 BD+00 992 9.50 B8V	6.95 AG+04 559 8.77 B8 HD 34054 7.30 B9V		7.36		7.03 AG+00 514 9.30 B8V	HD 34203 5.50 A0V	Blend (.30 A3V,A2V c 7.78 HD 34307 8.60 BRV	8.74 HD 34280 7.78 B8V	9.02 HD 34342 8.92 B9V	7.47 HD 34317 6.42 A0V	9.14 Blend 8.38 B9V,ADV	AG+13 436 8.30 A0	8.65 HD 34430 9.30 B8V	11.45 HD 290122 10.90 F4III	9.46 HD 34481 9.05 A0V	3.08 HD 34503 3.59 B5111 6 13 UD 24511 7 20 DEV	0.10 III 04011 (.09 Dov AG+05 596 8.70 B9	7.48 Blend 7.32 A0,B8V,B9V,A3V	10.31 Blend 7.10 A2V, B9V	11.43 Blend B9V,A5V,A5	9.10 AGTUL 004 9.10 AU 4.91 Blend 6.23 B1.5V.B9V	7.90 HD 34736 7.86 B9	AG-02 124 9.10 A3V	H.D 34811 7.70 A3V 8.45 BD-09 1124 10.00 A0		8.75 HD 34813 8.82 A0 c
	m <sub>1367</sub> m <sub>1519</sub> Identification V Sp. Type Note		8.56 9.29 AG+04 556 8.71 B9	10.54 HJ 33917 9.80 AUV 5.66 HD 33928 7.60 B8V			9.47 HD 293868 10.10 A5V 7 00 PD 07 1000 8 54 A0		9.36 BD+00 992 9.50 B8V	6.47 6.95 AG+04 559 8.77 B8 8.76 HD 34054 7.30 B9V	5.94	7.36 7.36 7.37	$R.69 \longrightarrow HD 34149 7.70 A0$		6.40 HD 34203 5.50 A0V	7.13 Blend 7.30 A3V,A2V C	8.74 HD 34280 7.78 B8V	9.02 HD 34342 8.92 B9V	7.74 7.47 HD 34317 6.42 A0V	9.14 Blend 8.38 B9V,ADV	8.80 AG+13 436 8.30 A0	8.65 HD 34430 9.30 B8V	11.45 HD 290122 10.90 F4III	9.46 HD 34481 9.05 A0V	3.08 HD 34503 3.59 B5111 E & A 10 UD 94611 7.90 DEV	7.88 A(1+05.596 8.70 B9	7.79 7.48 Blend 7.32 A0,B8V,B9V,A3V		11.43 Blend B9V,A5V,A5	9.10 AG+UI 304 9.10 AU 4.45 4.91 Blend 6.23 B1.5U.B9V	7.90 HD 34736 7.86 B9	7.75 AG-02 124 9.10 A3V	7.24 H.D 34811 7.70 A3V 8.45 BD-09 1124 10.00 A0	8.03	8.75 HD 34813 8.82 A0 c
	$\delta_{1950} m_{1367} m_{1519}$ Identification V Sp. Type Note	-0:12	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	- 2:37 10.54 HJ 33917 9.80 AUV - 3:42 5.66 HD 33928 7.60 B8V	- 2:03 8.94 HD 33975 9.30 B8V 6.56 6.46 HD 330047.34 B8	4:52 6.98 c	- 2:27 9.47 HD 293868 10.10 A5V	- 7:30 7:30 BD-01 1003 8:04 AU - 8:25 1.34 HD 34085 0.12 B8Iab:	0:23 9.36 BD+00 992 9.50 B8V	4:50 6.47 6.95 AG+04.559 8.77 B8 14:56 8.76 HD 34054 7.30 B9V	14:32 5.94		8:15 8.69 HD 34149 7.70 A0	0:51 7.03 AG+00 514 9.30 B8V	11:08 6.40 HD 34203 5.50 A0V	0:05 7.13 Blend 7.80 A5V,A2V C	- 3:31 8.74 HD 34280 7.78 B8V	- 5:10 9.02 HD 34342 8.92 B9V	1:55 7.74 7.47 HD 34317 6.42 A0V	- U:55 9.14 Blend 8.38 B9V,ADV 0.44 6.77	9:44 0.11 11D 04000 1.00 D0 12:53 8.80 AG+13 436 8.30 A0	- 2:36 8.65 HD 34430 9.30 B8V	0:24 11.45 HD 290122 10.90 F4III	- 4:48 9.46 HD 34481 9.05 A0V	- 6:57 3.08 HJ 34503 3.59 B5111 0.09 E.E.E. 6.19 UD 94511 7.90 DEV	- 0:03 0:03 0.13 LD 04:011 1.03 D.0V	- 1:08 7.79 7.48 Blend 7.32 A0,B8V,B9V,A3V	- 5:01 10.31 Blend 7.10 A2V, B9V	0:26 11.43 Blend B9V,A5V,A5	1:00 9.13 AGTU1 334 9.10 AU - 1:26 4 45 4 91 Blend 6.23 B1.5V.B9V	- 7:27 7.90 HD 34736 7.86 B9	- 2:23 7.75 AG-02 124 9.10 A3V	15:30 7.24 H.D 34811 7.70 A3V - 9:56 8.45 BD-09 1124 10.00 A0	11:45 8.03	- 7:02 8.75 HD 34813 8.82 A0 c
	$\alpha_{1950}$ $\delta_{1950}$ $m_{1367}$ $m_{1519}$ Identification V Sp. Type Note	5:10:23 - 0:12 10:57 AG-00 591 8.10 A0V 5:10.45 -1:52 0.56 HTD 33882 6.00 A5V	310.430 1:00 $3.26$ 11D 30003 $0.07$ $A3V510.50$ $4.07$ $8.56$ $9.29$ AG+04 556 $8.71$ B9	5:10:52 - 2:37 10:54 HJ 33917 9:50 A0V 5:11:07 - 3:42 5:66 HD 33928 7:60 B8V	5:11:11 - 2:03 8.94 HD 33975 9.30 B8V 5:11:05 6:56 6.46 HD 330647.34 B8	5:11:38 4:52 6.98 cc	5:11:48 - 2:27 9:47 HD 293868 10:10 A5V	5:12:09 - 6:30 1.34 HD 34085 0.12 B81ab:	5:12:16 0:23 9.36 BD+00 992 9.50 B8V	5:12:18 4:50 6.47 6.95 AG+04 559 8.77 B8 5-19:98 14:56 8.76 HD 34054 7.30 B9V	5:12:29 14:32 5.94		5:12:52 $8:15$ $8.69$ $$ $HD$ $34149$ $7.70$ A0	5:13:09 0:51 7.03 AG+00 514 9.30 B8V	5:13:10 11:08 6:40 HD 34203 5:50 A0V	5:13:33 0:05 1.13 Elend 1.30 A5V,A2V C	5:13:51 - 3:31 8.74 HD 34280 7.78 B8V	5:13:56 - 5:10 9.02 HD 34342 8.92 B9V	5:14:12 1:55 7.74 7.47 HD 34317 6.42 A0V	5:14:13 - 0:55 9.14 Blend 5.35 B9V,ADV 5:14:12 0.44 6.77 HD 34328 7.60 B2	0:14:16 12:53 8.80 AG+13 436 8.30 A0	5:14:39 - 2:36 8.65 HD 34430 9.30 B8V	5:15:00 0:24 11.45 HD 290122 10.90 F4III	5:15:07 - 4:48 9.46 HD 34481 9.05 A0V	5:15:12 - 6:57 3.08 HD 34503 3.59 B5111 E.1E.90 0.09 E.EE 8.19 UD 94511 7.90 DEV	2:10:29 - 0:03 2:03 0.13 0.10 0.10 0.10 0.09 D3V 5:15:51 5:11 7.88 AG+05.596 8.70 B9	5:16:40 - 1:08 7.79 7.48 Blend 7.32 A0,B8V,B9V,A3V	5:16:41 - 5:01 10.31 Blend 7.10 A2V,B9V	5:16:42 0:26 11.43 Blend B9V,A5V,A5	0:10:30 1:00 9.10 AGTU 334 9.10 AU 5.16:58 - 1.26 4 45 4.91 Blend 6.23 B1.5V.B9V	5:16:59 - 7:27 7.90 HD 34736 7.86 B9	5:17:01 - 2:23 7.75 AG-02 124 9.10 A3V	5:17:15 15:30 7.24 HJ 34811 7.70 A3V 5:17:22 - 9:56 8.45 BD-09 1124 10.00 A0	5:17:22 11:45 8.03	5:17:29 - 7:02 8.75 HD 34813 8.82 A0 c

TABLE 1—Continued

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Sp. Type	A0Vn B3V:n B9,A0,B2	Bovne B8 B9	A0 B5V	B8	B5V	A2 B9,A0	A0,A0 A0	AO	B2V B7V	B9, A5	B3V B3V	A0,A0,A2	B5V,B5IV,B7V	B8,A1: Ro	G5,K7	A7 B6V	BS	B9 A0	B8,B9	A0,B8,A2,A5 B2V	B1.5V	B3V B5V	B0V	B7IIIe,B7IV	BSV	09.511-1,09.511 A0,A0	
V	6.39 6.88 7.86	7.00	8.65 6.71	8.23	6.94	6.49 7.25	6.16 10.50	8.64	5.78 8.13	7.36	1.63	8.24	0.33 3.4P	7.95 8.36	8.69	11.69 7.95	6.60	8.09 9.53	7.63	7.32 6 23	5.46	7.56 7.56	4.62	5.11	7.69	1.44 7.95	
Identification	HD 36058 HD 36013 Blend	HD 36012 HD 36104 HD 36120	HD 36089 HD 36151	HD 36115	HD 36133	HD 36150 Blend	Blend BD±00 1002	HD 36234	HD 36166 HD 36165	Blend	HD 36262	Blend	Blend	Blend HD 36341	Blend	HD 290510 HD 36310	HD 36337	HD 36366 HD 290540	Blend	Blend HD 36430	HD 36351	HD 36392 HD 36429	HD 36512	Blend ACL00 540	HD 36541	Blend Blend	
<b>m</b> 1519	6.82 5.43 7.97	7.18	5.32	7.96 8.15	5.74	11.58 6.82	6.62	7.71	4.03 7.09	101	16.1	06 1	4.30 3.28	5.71 7 5.7	5	7.16		8.46 8.09		7.01	3.67	6.06 6.34	2.37		4.80	0.30 7.56	7.54
<b>m</b> 1367	5.18	5.87		7.12	5.44	6.81	5.76 6.36		3.67	5.82	5.61	8.99	3.25	5.76 7 5.4	6.90	9.77 6.74	5.91		6.87	7.19	3.36	5.81 6.05		5.60 7.16		0.60	
<b>b</b> 1950	- 3:16 1:39 - 2:07	2:10 12:09 - 5:46	- 2:54 - 7:15	5:12 0:03	3:08	- 0:46 - 1:46	- 0:05	- 5:11	1:48 2:09	10:09	- 1:00	3:33	- 7:25	- 0:03	9:03	- 1:16 4:39	14:48	- 6:09 - 1:48	9:10	- 2:03 6:41	3:17	1:42 2:50	- 7:16	17:00 9:36	- 6:41	- 0:17 - 6:22	4:13
<b>a</b> 1950	5:26:22 5:26:26 5:26:29	5:26:29 5:26:31 5:26:35	5:26:38 5:26:56	5:26:57 5:27:00	5:27:12	5:27:13 5:27:28	5:27:32 5.97.39	5:27:35	5:27:36	5:27:42	5:27:44	5:27:44	5:28:02	5:28:07	5:28:16	5:28:21 5:28:26	5:28:27	5:28:29 5:28:33	5:28:38	5:28:44 5:28:47	5:28:52	5:29:10 5:29:21	5:29:22	5:29:24 5:20-24	5:29:28	5:29:34 5:29:43	5:29:51
No.	226 227 228	230	233 233	234 235	236	237 238	239	241	242	244	246	247	249	250	252	253	255	256	258	259	261	262	264	265	267	268 269	270
Note											U		υυ		د	υ		υ	U	υ	υ	L	,				
Sp. Type	A0,A3,B9 B9V B3V	B <sup>9sp</sup> B9V,B9V B8	B2Vn B2.5V	B9.5Vn	A0VII A0	B9 B8,B9,A3,B9	30	32V	0 9IV	L L	, AU . A	3V	).A2	2V 0 EV-	5,G5,G	5V		~ ~		8V,B8V	,A,A2	,A2,A0	V,B8	7IV	60	6	B9.A0.A0.A5
4	403						<b>m</b> ~	4 144	Αà	386	ñĕ	Ä	9 A	<u>μ</u> ο	20	m m	A	ää	Ă		A0	A2 B3	ä	<u>с</u>	чш	д⊲	
н.	8 9.	6.57 6.53 8.27	6.24 6.16	6.23	8.70	7.70 7.32	8.00 1000	9.30 6.62 I	8.60 A	7.20 B5	7.94 BS 8.73 A(	7.22 B:	7.70 B9 8.6P A(	6.68 B	8.55 G	7.52 B. 8.89 B	8.93 A2	7.80 B8	9.77 A(	6.97 B	7.54 A0	7.90 A2 6.41 B3	7.29 B6	8.35 B	0.0/ H	6.67 B 9.30 A	7.23
Identification	Blend 8.0 HD 35522 7.1 HD 35575 6.4	HD 35548 6.57 Blend 6.53 HD 294046 8.27	HD 35532 6.24 HD 35588 6.16	HD 35640 6.23	HD 35658 8.70	HD 35635 7.70 Blend 7.32	HD 35685 8.00 H	HD 35777 6.62 H	AG+05 621 8.60 A HD 35715 4 50 B	HD 35730 7.20 B5	Blend 7.94 B Blend 8.73 A(	HD 35792 7.22 B	HD 35746 7.70 B9 Blend 8.6P A0	HD 35762 6.68 B	Blend 8.55 G	HD 35899 7.52 B BD+01 1017 8.89 B	HD 35836 8.93 A2	HD 35882 7.80 B8 HD 35867 8 12 B6	HD 290470 9.77 A(	Blend 6.97 B	Blend 7.54 A0	Blend 7.90 A2 HD 35012 6 41 B2	Blend 7.29 B6	HD 35926 8.35 B	HD 35945 7.65 H	HD 35971 6.67 B AG+08 605 9.30 A	Blend 7.23
m <sub>1519</sub> Identification	9.10 Blend 8.0 4.91 HD 35522 7.	6.79 HJJ 35548 6.57 Blend 6.53 5.96 HD 294046 8.27	HD 35532 6.24 4.59 HD 35588 6.16	6.09 HD 35640 6.23	13.26 HD 35658 8.70	HD 35635 7.70 7.34 Blend 7.32	6.83 HD 35685 8.00 H	5.03 HD 35777 6.62 H	9.86 AG+05 621 8.60 A	5.55 HD 35730 7.20 B5	8.03 Blend 7.94 BS 10.01 Blend 8.73 A(	5.80 HD 35792 7.22 B		5.08 HD 35762 6.68 B UD 35770 5.50 D	7.82 Blend 8.55 G	HD 35899 7.52 B BD+01 1017 8.89 B	8.47 HD 35836 8.93 A	6.31 HD 35882 7.80 B8 7.87 HD 35867 812 BC	5.96 HD 290470 9.77 AC	5.10 Blend 6.97 B	6.14 Blend 7.54 A0		6.52 Blend 7.29 B6	7.48 HD 35926 8.35 B	U.04 П. 509/1 0.0/ I —— HD 35945 7.65 F	8.37 HD 35971 6.67 B AG+08 605 9.30 A	6.78 Blend 7.23
m <sub>1367</sub> m <sub>1519</sub> Identification	8.17 9.10 Blend 8.0 6.91 — HD 35522 7. 4.37 4.91 HD 35575 6.	6.59 6.79 HJJ 35548 6.57 7.63 — Blend 6.53 — 5.96 HJD 294046 8.27	4.80 HD 35532 6.24 4.11 4.59 HD 35588 6.16	7 21 6.09 HD 35640 6.23	1.31 0.30 HD 33030 0.42 13.26 HD 35658 8.70	6.93 — HD 35635 7.70 7.20 7.34 Blend 7.32	6.83 HD 35685 8.00 F	4.53 5.03 HD 35777 6.62 F	2 48 2 78 HD 35715 4 50 B	5.30 5.55 HD 35730 7.20 B5	7.73 8.03 Blend 7.94 BS	5.45 5.80 HD 35792 7.22 B	6.38 —— HJ 35746 7.70 B9 8.50 8.31 Blend 8.6P A(	4.76 5.08 HD 35762 6.68 B	7.82 Blend 8.55 G	5.82 HD 35899 7.52 B 9.29 BD+01 1017 8.89 B		6.38 6.31 HD 35882 7.80 B8 770 787 HD 35867 812 B6	6.21 5.96 HD 290470 9.77 AC	4.85 5.10 Blend 6.97 B	6.21 6.14 Blend 7.54 A0	6.93 — Blend 7.90 A2 4.28 4.57 HD 35012 6.41 R2	6.22 6.52 Blend 7.29 B6	7.46 7.48 HD 35926 8.35 B	7.76 HD 35945 7.65 F		6.98 6.78 Blend 7.23
61950 m1367 m1519 Identification	2:45 8.17 9.10 Blend 8.0 15:19 6.91	- 0:32 6.59 6.79 HJJ 35548 6.57 15:33 7.63 Blend 6.53 - 2:18 5.96 HJD 294046 8.27	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	- 5:30 6.09 HD 35640 6.23	- 3:03 - 13.26 HD 35658 8.70	13:25 6.93 — HD 35635 7.70 0:51 7.20 7.34 Blend 7.32	-10:55 6.83 HD 35685 8.00 F	- 2:23 4.53 5.03 HD 35777 6.62 F	5:33 8.86 AG+05 621 8.60 A 3.04 9.48 9.78 HD 35715 4.50 B	3:36 5.30 5.55 HD 35730 7.20 B5	2:04 1.73 8.03 Blend 7.94 BC - 2:56 10.01 Blend 8.73 A(	-1:22 5.45 5.80 HD 35792 7.22 B	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	3:50 4.76 5.08 HD 35762 6.68 B	-4:10 7.82 Blend 8.55 G	- 2:14 5.82 HD 35899 7.52 B 1:36 9.29 BD+01 1017 8.89 B	0:16 8.47 HD 35836 8.93 A2	- 1:50 6.38 6.31 HD 35882 7.80 B8 - 0-15 770 787 HD 35867 8 12 BC	- 2:04 6.21 5.96 HD 290470 9.77 A(	1:07 4.85 5.10 Blend 6.97 B	-2:00 6.21 6.14 Blend 7.54 A0	5:55 6.93 — Blend 7.90 A2 1.18 4.28 4.57 HD 35012 6.41 B2	3:31 6.22 6.52 Blend 7.29 B6	0:48 7.46 7.48 HD 35926 8.35 B	U:02 0.01 0.04 HD 35941 0.01 HD 35945 7.65 H	- 2:41 8.37 HD 35971 6.67 B 8:54 7.66 AG+08 605 9.30 A	- 0:37 6.98 6.78 Blend 7.23
a1950 b1950 m1367 m1519 Identification	5.22:52 2:45 8.17 9.10 Blend 8.0 5.22:58 15:19 6.91 HD 35522 7.1 5:22:01 - 1:30 4.37 4.91 HD 35575 6.1	5:23:03 - 0:32 6.59 6.79 HJJ 35548 6.57 5:23:05 15:33 7.63 — Blend 6.53 5:23:17 - 2:18 — 5.96 HD 294046 8.27	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	5:23:28 - 5:30 6.09 HD 35640 6.23	5:23:38 - 3:03 / 3.1 0.30 HD 35658 8.70	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	5:24:04 -10:55 6.83 HD 35685 8.00 F	5:24:19 - 0:31 0.31 HD 35777 6.62 F	5:24:26 5:33 — 8.86 AG+05 621 8.60 A 5:24:28 3:04 2.48 2.78 HD 35715 4.50 B	5:24:29 3:36 5.30 5.55 HD 35730 7.20 B5	5:24:30 2:04 7.73 5.03 Blend 7.94 BS 5:24:35 - 2:56 10.01 Blend 8.73 A(	5:24:35 - 1:22 5.45 5.80 HD 35792 7.22 B:	5:24:37 15:56 6.38 —— HJ 35746 7.70 B9 5:24:42 2:15 8.50 8.31 Blend 8.6P A(	5:24:42 3:50 4.76 5.08 HD 35762 6.68 B	5:25:00 - 4:10 7.82 Blend 8.55 G	5:25:00 - 2:14 5.82 HD 35899 7.52 B 5:25:03 1:36 9.29 BD+01 1017 8.89 B	5:25:05 0:16 8.47 HD 35836 8.93 A2	5:25:11 - 1:50 6.38 6.31 HD 35882 7.80 B6 5:25:17 - 0:15 770 7.87 HD 35867 8.12 B6	5:25:21 - 2:04 6.21 5.96 HD 290470 9.77 A(	5:25:27 1:07 4.85 5.10 Blend 6.97 B	5:25:35 - 2:00 6.21 6.14 Blend 7.54 A0	5:25:39 5:55 6.93 — Blend 7.90 A2 5:25:42 1:18 4.28 4.57 HD 35012 6.41 B2	5:25:43 3:31 6.22 6.52 Blend 7.29 B6	5:25:49 0:48 7.46 7.48 HD 35926 8.35 B	5:26:03 16:22 7.76 HD 35945 7.65 F	5:26:04 - 2:41 8.37 HD 35971 6.67 B 5:26:15 8:54 7.66 AG+08 605 9.30 A	5:26:17 - 0:37 6.98 6.78 Blend 7.23

TABLE 1—Continued

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Note										e														U	) U	υ				υ									
Sp. Type		B3IV An	A0	A0,A3 B0,A0	B9 A0	AO	B9	B2.5V, B2.5IV, B3V, B2Vp	B6V,A0A0Vpe	B01ab:		B6V, B9.5V B0IV V., B0	D31 V P, D3 R8. A0 R8 R8	B6V	BIV	B2IV-V	B8V,A1111-1V	BEV AD B8	B9.A3	BIVvar	BellI		D4 V, D8 F5 K5	BL5V	A0,A0	B2IV-V	B5V,A1III-IV,A	B9,A0,A511-111	D0V,D3V A9	B6V.B9.B8V.B9.A0.B8	B2V	A0,B8V	B9p,A0,A0	AO	B1.51V	09.3V A4V	B9	B3V,A2	B71V-V
4		6.41 9.27	8.00	8.05	77.00	8.75	8.10	4.8P	7.60	1.70	7 53	20.1	7 50	7.86	5.72	6.12	7.75	7 36	7.47	6.05	5.88	9.00	0.43 6.65	7.17	7.85	6.19	7.14	02.7	0.9U 6.87	6.29	6.83	7.80	7.54	7.30	0.90	3.00 4.80	7.09	6.85	7.90
Identification		HD 37055 HD 37057	HD 37079	Blend	Blend	HD 37054	AG+11 548	Blend	Blend	HD 37128	HD 3/151	Diend	Blend	HD 37173	HD 37209	HD 37232	Blend	Bland	Blend	NGC 1977 10	HD 37320	AG+09 567	Blend Blend	HD 37334	Blend	HD 37356	Blend	Blend	Diena HD 37410	Blend	HD 37397	Blend	Blend	HD 37441	HD 37481	HD 37507	HD 37492	Blend	HD 37467
m.1519		5.05 8.58	8.35	7.80	515	8.12		3.17		-1.33	6.70	5.24	1.04	6.82	2.32		5.27	9.80 8.75	7.87	3.50	5.50		67.0 877	4.41	5.98	4.22	4.84	5.92	0.90	5.59	4.70	7.48	6.86		4.09	7.20	6.74	6.24	7.23
<b>m</b> 1367	1001			8.07	06.1	7.90	7.10		5.53	0.51	1	6.54	0 1 9	6.34		4.11	6.23	6 60	7.67		5.55	8.09	0.04		6.31		5.76		0/.0	5.71	4.60			8.49		11.1			7.38
61950	Oper-	3:14	- 8:38	0:31	0:00 6-15	0:45	11:46	- 4:24	- 0:50	- 1:09	- 7:22	- 1:40	01.0	2:02	6:01	8:57	- 0:42	01:0	4:46	- 5:54	7:34	9:53	1:2/	- 4-53	0:14	- 4:47	- 0:47	6:42	90:D	0:11	- 1:12	- 1:44	6:08	14:28	0:32	2:30	- 8:27	- 5:10	2:52
Q 1950	ODET	5:33:00	5:33:04	5:33:05	0:33:U9 5-33-17	5:33:19	5:33:21	5:33:25	5:33:26	5:33:32	5:33:32	5:33:43	0:33:49 . 5.22.51	5:33:53	5:33:54	5:34:15	5:34:26	0:34:28 5.94.99	5:34:39	5:34:45	5:34:53	5:34:58	0:30:00 5.25.00	5.35.00	5:35:03	5:35:11	5:35:15	5:35:15	0:30:32 5.25.22	5:35:40	5:35:41	5:35:43	5:35:48	5:35:51	5:35:55	5:36:14	5:36:14	5:36:20	5:36:29
, 0.		316	318	319	220 221	322	323	324	22	226	21	82.0	67	31 0	32	33	34	535 2 2 2 2	37	338	339	340	241 243	343	344	345	46	47	40 7	120	21	52	53	54	<u>.</u>	57 157	358	59	360
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Notell			,	υ υ		<u> </u>	<u>ں</u>		U	<u>ں</u>	<u> </u>	<u>ຕ</u> ຸ	υ Ο	<u></u>	<del>ري ر</del>	~	<u> </u>		υ υ	υ υ											,	<u></u>	<u> </u>	<u> </u>			P		
Sp. Type Notel		B9V B0 A9	BIIV	B2Vvar,B7III,B9 c	B9	B9	B9 c (1	B3V	A0 c	<u>A0,A0,A0</u> c	B6V	BIV c 3			B2.5V c 3	B5 3	B7V,08,A0	B2V	AZ R8	B5Vn c	BollI	B8		B5V,B3V,B1V	B9IIImnb	08III,0.	B3V	Ballip	A2	AU Br	B7V c 3	3	B8,A3		B3V	A0 R3	P IIIGO		A0
V Sp. Type Notel		8.66 B9V	5.35 B1IV	6.92 B2Vvar,B7III,B9 c	7.96 B9	8.60 B9	8.42 B9 c 1	5.63 B3V	8.98 A0 c	8.21 A0,A0,A0 c	7.56 B6V	5.38 BIV c 3	8.04 B9 C 3	7.81 AD AD	6.23 B2.5V c 3	6.68 B5 3	7.11 B7V,08,A0	6.59 B2V	8 40 B8	8.21 B5Vn c	4.41 B0III	8.53 B8	5.36 A2V	7.30 B0V, B6V, B/V	5.60 B9IIImno	2.59 O8III,O.	6.69 B3V	6.73 B8IIIp	8.20 A2	7.04 B5	7.50 B7V c		7.85 B8,A3		6.94 B3V	8.97 A0.R3	2.77 09III d		8.90 A0
Identification V Sp. Type Notel		HD 36542 8.66 B9V	HD 36591 5.35 B1IV	Blend 6.92 B2Vvar,B7III,B9 c	HD 36605 7.96 B9 UD 36640 8.58 BeV	NGC 1977 50 8.60 B9	HD 36617 8.42 B9 c 1	HD 36653 5.63 B3V	NGC 1977 62 8.98 A0 c	Blend $8.21  A0, A0, A0$ c 3	HD 36627 7.56 B6V 3	HD 36695 5.38 BIV c 3	HU 30045 8.04 B9 C 3	н⊔ 30008 8.00 Б0 №р Blend 7.81 A0 A0	HD 36779 6.23 B2.5V c 3	HD 36827 6.68 B5 3	Blend 7.11 B7V,08,A0 3	HD 36741 6.59 B2V	HU 294180 10.00 AZ C C C A	HD 36826 8.21 $B5Vn$ c 3	HD 36822 4.41 B0III	AG+04 610 8.53 B8	HD 36777 5.36 A2V	Diend 0.33 D3V,D5V,D1V	HD 36881 5.60 B9IIImnp	Blend 2.59 08111,0	HD 36824 6.69 B3V	HD 36916 6.73 B8111p	AG+06 595 8.20 A2	HD 36808 7.04 RK	HD 36935 7.50 B7V c 3	NGC 1977 3	Blend 7.85 B8,A3 3	NGC 1977 13	HD 36954 6.94 B3V	NGC 1977 R 27 A0 R3	HD 37043 2.77 09III d		AG+04 612 8.90 A0
m Identification V Sp. Type Notel		8.76 HD 36542 8.66 B9V	2.85 HD 36591 5.35 B1IV	5.93 Blend 6.92 B2Vvar,B7III,B9 c	6.43 HD 36605 7.96 B9	6.00 NGC 1977 50 8.60 B9	8.08 HD 36617 8.42 B9 c 1	HD 36653 5.63 B3V	6.69 NGC 1977 62 8.98 A0 c	7.71 Blend 8.21 A0,A0,A0 c	6.59 HD 36627 7.56 B6V 3		7.65 HJ 30045 8.04 B9 C 3	7.23 HJ 30008 8.00 D0 VWP 3 6.64 Riend 7.81 A0 A0	2.84 HD 36779 6.23 B2.5V c 3	5.13 HD 36827 6.68 B5	6.36 Blend 7.11 B7V,08,A0 3	4.74 HD 36741 6.59 B2V	HU 294188 10.33 AZ C C	7.06 HD 36826 8.21 B5Vn c	HD 36822 4.41 B0III	7.95 AG+04 610 8.53 B8	6.73 HD 36777 5.36 A2V	3.45 Diend 0.33 D5V,D5V,D1V	HD 36881 5.60 B9111mnp	Blend 2.59 08III,0	5.14 HD 36824 6.69 B3V	5.60 HD 36916 6.73 B8111p	AG+06 595 8.20 AZ	1.09 HL 3/001 0.09 AU 5.51 HD 36808 7.04 R5 5.	5.96 HD 36935 7.50 B7V c 3	1.59 NGC 1977 3	Blend 7.85 B8,A3 3	2.54 NGC 1977	4.55 HD 36954 6.94 B3V	2.11 NGC 1977 708 Riend 8.97 AD R3	1.22 HD 37043 2.77 09III d		8.37 AG+04 612 8.90 A0
m Identification V Sp. Type Notel		8.76 HD 36542 8.66 B9V	2.82 2.85 HD 36591 5.35 B1IV	5.93 Blend 6.92 B2Vvar,B7III,B9 c	6.71 6.43 HJ 36605 7.96 B9	6.00 NGC 1977 50 8.60 B9	8.08 HD 36617 8.42 B9 c 1	4.03 HD 36653 5.63 B3V	6.69 NGC 1977 62 8.98 A0 c	7.73 7.71 Blend 8.21 A0,A0,A0 c	6.40 6.59 HD 36627 7.56 B6V 3	2.75 — HD 36695 5.38 BIV c 3	7.63 7.65 HJ 30045 8.04 B9 C 3	(.(3 (.23 HL) 30008 5.00 DOVWP 6.90 6.64 Riend 7.81 A0 A0	2.65 2.84 HD 36779 6.23 B2.5V c	4.72 5.13 HD 36827 6.68 B5	6.75 6.36 Blend 7.11 B7V,08,A0 3	4.40 4.74 HJ 36741 6.59 B2V	7.19 HJ 294186 10.33 AZ C C C C C C C C C C C C C C C C C C	6.12 7.06 HD 36826 8.21 B5Vn c	2.20 — HD 36822 4.41 B0III	7.39 7.95 AG+04 610 8.53 B8	7.59 6.73 HD 36777 5.36 A2V	3.48 Diend 0.33 D3V, D5V, D1V $7$ $7$ $7$ $10$ $20$ $20$ $20$	5.24 HD 36881 5.60 B9IIImnp	1.40 Blend 2.59 O8III,O 3	5.02 5.14 HD 36824 6.69 B3V	5.60 HD 36916 6.73 B8111p	$6.27 \longrightarrow AG+06.595 8.20 A2$	(.09 П.J. 5/001 5.69 АО К.А. К.К.1 Н.П. 36808 7.04 ВК - [3	5.48 5.96 HD 36935 7.50 B7V C	1.59 NGC 1977 3	5.69 Blend 7.85 B8,A3 3	2.54 NGC 1977	5.05 4.55 HD 36954 6.94 B3V	2.11 NGC 1977 7 08 Riand 8 97 AD R3	1.22 HD 37043 2.77 09III d	8.43 3	8.06 8.37 AG+04 612 8.90 A0
A m Identification V Sp. Type Notel		-10:03 8.76 HD 36542 8.66 B9V	- 1:40 2.82 2.85 HD 36591 5.35 B1IV	- 4:32 5.93 Blend 6.92 B2Vvar,B7III,B9 c	- 0:41 6.71 6.43 HJ 36605 7.96 B9	2.00 $1.30$ $1.10$ $1.10$ $30345$ $9.00$ $200$ $200$ $200$ $200$ $200$	- 2.11 8.08 HD 36617 8.42 B9 c 1	14:11 4.03 HD 36653 5.63 B3V	- 4:23 6.69 NGC 1977 62 8.98 A0 c	2:30 7.73 7.71 Blend 8.21 A0,A0,A0 c	3:08 6.40 6.59 HD 36627 7.56 B6V 3	- 1:12 2.75 HD 36695 5.38 BIV c 3	2:23 7.63 7.65 HJ 30045 8.04 B9 c 5	U:38 (./3 (.23 HL) 30008 5.00 D0 VWP 0.09 6.90 6.64 Riend 7.81 A0 A0	-1.04 2.65 2.84 HD 36779 6.23 B2.5V c 3	- 2:55 4.72 5.13 HD 36827 6.68 B5	- 0:28 6.75 6.36 Blend 7.11 B7V,08,A0 3	1:25 4.40 4.74 HJ 36741 6.59 B2V	- Z:3U /.IY H.D. Z94180 10.30 A.Z C 9 13.18 8.07 A.C.±13.468 8.40 R.8	-2.21 6.12 7.06 HD 36826 8.21 B5Vn c	9:29 2.20 — HD 36822 4.41 B0III	4:49 7.39 7.95 AG+04 610 8.53 B8	3:46 7.59 6.73 HD 36777 5.36 A2V	- 4:27 3.45 Diend 0.33 D3V,D5V,D1V	10:12 5.24 — HD 36881 5.60 B9IIImn	9:53 1.40 Blend 2.59 O8III,O.	5:39 5.02 5.14 HD 36824 6.69 B3V	- 4:05 5.60 HD 36916 6.73 B8111p	$6:36$ $6.27$ $\longrightarrow$ AG+06 595 8.20 A2	- 0:31 1.09 LLU 3/001 0.09 AU 0.07 K 63 K KI HD 36808 7.04 RK	- 0.01 5.48 5.96 HD 36935 7.50 B7V c	- 5:24 1.59 NGC 1977 3	5:29 5.69 Blend 7.85 B8,A3 3	- 4:26 2.54 NGC 1977 13	- 0:44 5.05 4.55 HD 36954 6.94 B3V	- 4:47 2.11 NGC 1977 105 Riand 8.77 A0 R3	- 5:51 1.22 HD 37043 2.77 09III d	15:19 8.43 3	4:50 8.06 8.37 AG+04 612 8.90 A0
According the second		5:29:56 -10:03 8.76 HD 36542 8.66 B9V	5:30:17 - 1:40 2.82 2.85 HD 36591 5.35 B1IV	5:30:18 - 4:32 5.93 Blend 6.92 B2Vvar,B7III,B9 c	5:30:19 - 0:41 6.71 6.43 HJ 36605 7.96 B9	5:30:20 2:00 1.30 1.10 112 30349 9:00 DO WP	5:30.21 - 2:11 8.08 HD 36617 8.42 B9 c 1	5:30:38 14:11 4.03 HD 36653 5.63 B3V	5:30:38 - 4:23 6.69 NGC 1977 62 8.98 A0 c	5:30:43 2:30 7.73 7.71 Blend 8.21 A0,A0,A0 c	5:30:47 3:08 6.40 6.59 HD 36627 7.56 B6V	5:30:56 - 1:12 2.75 HD 36695 5.38 BIV c 3	5:31:02 2:23 7.63 7.65 HJ 30045 8.04 B9 C 3	5:31:05 0:38 7.73 7.23 HJU 30008 5.00 D0 WP 5:31:10 0.02 6.20 6.64 Riend 7.81 A0 A0	5:31:26 - 1:04 2.65 2.84 HD 36779 6.23 B2.5V c 3	5:31:33 - 2:55 4.72 5.13 HD 36827 6.68 B5	5:31:35 - 0:28 6.75 6.36 Blend 7.11 B7V,08,A0 3	5:31:38 1:25 4.40 4.74 HJ 36741 6.59 B2V	5:31:40 - 2:30 7.19 HJ 294188 10.55 AZ C 9 5:31:41 19:18 8.07 AC-13.468 8.40 B8	5.31.47 - 2.21 6.12 7.06 HD 36826 8.21 B5Vn c 3	5:31:47 9:29 2.20 — HD 36822 4.41 B0III	5:31:47 4:49 7.39 7.95 AG+04 610 8.53 B8	5:31:52 3:46 7.59 6.73 HD 36777 5.36 A2V	5:31:53 - 4:27 3.48 Diend 0.33 D5V,D5V,D1V 1 E.91.E0 1E.99 7 E9 HT 26990 7.90 D0	5:31:30 10:12 5.24 —— HD 36881 5.60 B9IIImno	5:32:01 9:53 1.40 Blend 2.59 08III,0	5:32:01 5:39 5.02 5.14 HD 36824 6.69 B3V	5:22:15 - 4:05 5.60 HD 36916 6.73 B8IIIp	5:32:21 6:36 6.27 —— AG+06 595 8.20 AZ	0:32:21 - 0:31 1.09 HD 36808 7.04 Rt 13:32:30 13:32:30 13:32:30	5.22.20 - 0.18 5.48 5.96 HD 36935 7.50 B7V c 3	5:22:37 - 5:24 1.59 NGC 1977  3	5:32:38 5:29 5.69 Blend 7.85 B8,A3 3	5:32:41 - 4:26 2.54 NGC 1977 13	5:22:42 - 0:44 5.05 4.55 HD 36954 6.94 B3V	5:32:42 - 4:47 2.11 NGC 1977 5:32:44 9:90 7.08 Riend 8.97 A0 R3	5:32:48 - 5:51 1.22 HD 37043 2.77 09III d	5:32:54 15:19 8.43 3	5:32:57 4:50 8.06 8.37 AG+04 612 8.90 A0

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TABLE 1—Continued

	Note																4-1													
	Sp. Type	A0,A0V A0 B8 B9	B8	A0	Bo	A0	B9 49	A0	B8,A2 B0	A0	ע 10 קינו		Dol11	A0 A0	B9 F8	A3Vn		A0 A0	A0,A3	GO	B2IV-V B5	A5V	B9 Dell	F0 V	BB	A4V Bolsh:	B9	A0	B9 A0	B9IV B8
	2	8.58 8.90 8.50	6.75	9.53	7.61	7.20	8.78 6.78	8.00	6.99	8.72	8.30 0.2P		00 8	8.00	8.13 8.30	5.72	100	7.90	7.97	9.10	5.29 6.69	5.27	7.67	8.50	8.46	6.03 7 06	7.29	7.29	8.23 8.23	4.91 9.10
	Identification	Blend HD 38047 Blend	HD 38098	HD 38184	HD 38185	HD 38292	AG+13 483 HD 38313	BD-07 1162	Blend UD 20270	HD 38311	AG+04 639 Bland		UD 96470	HD 38454	BD-04 1237	HD 38545	Blend	HD 38528	Blend	BD-07 1170	HD 38622	HD 38710	HD 38650	HU 38(55 AG+12 603	HD 38800	HD 38735 HD 38735	HD 38824	HD 38798	AG+14 546 HD 38868	HD 38899 AG+14 548
	<b>m</b> 1519	8.79 7.21 6.52		8.74	6.07	8.27 8.27	0 58	9.51	6.66	8.88	10.61			8.64	8.78			9.02	1.61	1.87	ļ	8.58	7.80	0.04	8.17	8.10	6.47	7.83	8.45	
	<b>m</b> 1367	7.29	6.73	20.0			8.61		6.68	0.02	8 93	6.76	6.27	0.00	1 04	8.22	7.62	00.1	7.01	16.1	3.67 5.00	66.0	7.37	6.14				7.58	.02	4.99 8.69
	<b>b</b> 1950	4:59 1:29 6:56	5:27	7:16	8:55	- U:58 4:42	13:40 6.51	7:43	6:23	20:0 ·	4:47 9-00	11:07	0:57	10:48 $10:48$	- 4:00	14:27	0:38	o:30 2:37	2:14	7:50	13:53	6:26	4:07	0:20 12:01	6:08	10:33	8:21	4:43	14:05 5:51	12:39
ווומרמ	<b>a</b> 1950	5:40:28 5:40:34 5:40:30	5:40:44	5:40:58 -	5:41:17	5:41:18 5:41:48	5:41:51	5:42:01	5:42:04	5:42:23	5:42:31 5.42:37	5:42:47	5:43:01	5:43:36 -	5:43:38	5:43:50	5:43:59	5:44:11 5:44:11	5:44:12	5:44:20	5:44:20	5:44:46	5:44:51	5:45:19	5:45:23	5:45:30 - E.45.39	5:45:43	5:45:44	5:45:45 5:45:49	5:46:06 5:46:10
	No.	406 407	409	410	412	413	415	417	418	419	421	423	424	426	427	429	430	431	433	435	436	438	439	441	442	443	445	446	447 448	449 450
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	z																													
	Sp. Type N	K7,? A0	F5	AU B9	F8,A5	B9 B7V	A0,A0	B&V B3Vn	A2,B3Vn	$\mathbf{B2}$ B9	B6V Be Bo	ро, ру А0	B1.5V,A0	Uylab:,Uy.blb B8.A0	B3IV,B3V,B4V	B2IV - V B2IV		A2 A0	B8	ku A3	B9.5IIIs	B2V,AU	A0V	B1.5V,A5 Agiv_V Bg	F5	KIIV	B4V RR	F5	B8 R0	B5V
	V Sp. Type N	9.4P K7,? 8.80 A0	10.0P F5	8.01 B9	9.27 F8,A5	8.04 B9 6.50 B7V	7.83 A0,A0	0.90 B&V 8.01 B3Vn	6.51 A2,B3Vn	10.36 AZ 7.40 B5,B9	7.90 B6V	0.00 Do,D3 9.18 A0.	6.02 B1.5V,A0	0.99 091ab:,09.51b 7.32 B8.A0	-0.02 B3IV,B3V,B4V	4.30 D21V-V 6.98 B2IV		10.32 A2 8.05 A0	7.90 B8	8.50 KU 10.82 A3	6.45 B9.5IIIs	7.40 BZV,AU	7.67 A0V	6.92 B1.5V,A5 6.96 AOIV_V B0	9.30 F5	6.73 K1IV	8.80 D4V 6.68 B8	9.50 F5	8.53 B8 8.17 R0	8.28 B5V
	Identification V Sp. Type N	Blend 9.4P K7,? AG+11 556 8.80 A0	HD 290715 10.0P F5	AG+09 574 8.50 AU HD 37591 8.01 B9	Blend 9.27 F8,A5	HD 37642 8.04 B9 HD 37635 6.50 B7V	Blend 7.83 A0,A0	HD 37600 0.90 B8V HD 37622 8.01 B3Vn	Blend 6.51 A2, B3Vn	H.D. 290798 10.36 AZ Blend 7.40 B5,B9	HD 37700 7.90 B6V $m_{1-1}^{2}$ 2.60 P6 P6	HD 37745 9.18 A0.	Blend 6.02 B1.5V,A0	Blend 0.99 091ab:,09.51b Blend 7.32 B8.A0	Blend -0.02 B3IV,B3V,B4V	HD 37776 6.98 B2IV		H.D 290775 10.32 A2 HD 37846 8.05 A0	HD 37807 7.90 B8	AG+16 499 8.50 KU HD 290779 10.82 A3	HD 37808 6.45 B9.5IIIs	Blend (.40 B2V,A0	HD 37887 7.67 A0V	Blend 6.92 B1.5V,A5 Blend 6.96 A0IV_V R0	AG+05 654 9.30 F5	HD 37981 6.73 K1IV	HD 38023 8.86 B4V HD 37958 6.68 B8	AG+11 563 9.50 F5	HD 38051 8.53 B8 HD 38022 8.17 R0	HD 38087 8.28 B5V
	m1519 Identification V Sp. Type N		HD 290715 10.0P F5	AG+09 5/4 8.50 AU 7.00 HD 37591 8.01 B9	7.25 Blend 9.27 F8,A5	6.97 HD 37642 8.04 B9 5.49 HD 37635 6.50 B7V	7.51 Blend 7.83 A0,A0	0.43 HD 37600 0.90 B8V 6.34 HD 37622 8.01 B3Vn	4.39 Blend 6.51 A2,B3Vn	9.23 HJ 290798 10.36 AZ 5.49 Blend 7.40 B5,B9	6.83 HD 37700 7.90 B6V	0.40 District $0.00$ Do, D3, D3, D3, D3, D3, D3, D3, D3, D3, D3	4.38 Blend 6.02 B1.5V,A0	0.28 Blend 0.99 091ab;,09.51b Blend 7.32 B8.A0	Blend -0.02 B3IV,B4V	3.11 HD 31730 4.93 D21V-V 3.62 HD 37776 6.98 B2IV		H.D 290775 10.32 A2 9.78 HD 37846 8.05 A0	6.10 HD 37807 7.90 B8	AG+16 499 8.50 KU 8.70 HD 290779 10.82 A3	5.76 HD 37808 6.45 B9.5IIIs	6.00 Blend (.40 BZV,A0 11.21	6.48 HD 37887 7.67 A0V	3.79 Blend 6.92 B1.5V,A5 6.55 Blend 6.92 B1.5V,A5	AG+05 654 9.30 F5	HD 37981 6.73 K1IV	10.18 HJ 38023 8.80 B4V 6.60 HJ 37958 6.68 B8	AG+11 563 9.50 F5	8.78 HD 38051 8.53 B8 6 06 HD 38072 8.17 R0	6.37 HD 38087 8.28 B5V
	m <sub>1367</sub> m <sub>1519</sub> Identification V Sp. Type N	5.26 — Blend 9.4P K7,7 8.13 — AG+11 556 8.80 A0	6.54	7.15 7.00 HD 37591 8.01 B9	7.25 Blend 9.27 F8,A5	6.97 HD 37642 8.04 B9 5.49 HD 37635 6.50 B7V	8.17 7.51 Blend 7.83 A0,A0	6.02 0.43 HJ 37600 0.90 D8V	5.03 4.39 Blend 6.51 A2,B3Vn	9.23 HJJ 290798 10.36 AZ 6.33 5.49 Blend 7.40 B5,B9	= 6.83  HD  37700  7.90  B6V	0.40 Digits 0.00 D0,D3 9.14 HD 37745 9.18 A0.	4.38 Blend 6.02 B1.5V,A0	0.18 0.28 Blend 0.99 091ab;,09.51b 5.74 — Blend 7.32 B8.A0	3.31 — Blend -0.02 B3IV,B3V,B4V	2.52 3.11 HD 3/130 4.93 D21V-V 4.68 3.62 HD 37776 6.98 B2IV	8.55	6.73 —— HJJ 290775 10.32 A2 —— 9.78 HD 37846 8.05 A0	6.10 HD 37807 7.90 B8	9.77 AG+16 499 8.50 KU 8.70 HD 290779 10.82 A3	5.76 HD 37808 6.45 B9.5IIIs	6.00 Blend 7.40 B2V,A0	6.48 HD 37887 7.67 A0V	3.79 Blend 6.92 B1.5V,A5	5.62 AG+05 654 9.30 F5	7.60 HD 37981 6.73 K1IV	10.18 H.D. 38023 8.86 В4V 6 94 6 60 HD 37958 6 68 В8	5.09 AG+11 563 9.50 F5	8.78 HD 38051 8.53 B8 7 02 6 06 HD 38092 8 17 B0	7.86
	61950 m1367 m1519 Identification V Sp. Type N	- 0:23 5.26 Blend 9.4P K7,7 11:09 8.13 5.60 AG+11 556 8.80 A0	$\frac{4.01}{0.30}$ 6.54 $$ HD 290715 10.0P F5	9:30 7.89 AG+09.574 8.50 AU 4:26 7.15 7.00 HD 37591 8.01 B9	- 6:37 7.25 Blend 9.27 F8,A5	- 3:19 6.97 HD 37642 8.04 B9 - 9:42 5.49 HD 37635 6.50 B7V	0:55 8.17 7.51 Blend 7.83 A0,A0	1:32 0.02 0.43 HJ 37000 0.90 D8V .11-17 — 6.34 HD 37622 8.01 B3Vn	- 1:30 5.03 4.39 Blend 6.51 A2,B3Vn	- 0:45 9.23 HJ 230798 10.36 AZ - 2:30 6.33 5.49 Blend 7.40 B5,B9	- 4:25 6.83 HD 37700 7.90 B6V	-3.20 $0.40$ Digitary 0.00 Do, D3. $-3.56$ $9.14$ HD $37745$ $9.18$ A0.	- 2:49	- 2:01 0.18 0.28 Blend 0.99 091ab;,09.51b 9:14 5.74 — Blend 7.32 B8.A0	16:30 3.31 — Blend -0.02 B3IV,B3V,B4V	- 1:09 2.62 3.11 HJ 31(30 4.93 D21V-V - 1:33 4.68 3.62 HD 37776 6.98 B2IV	8:28 8.55	0:33 6.73 —— HJ 290775 10.32 A2 - 8:01 —— 9.78 HD 37846 8.05 A0	- 3:38 6.10 HD 37807 7.90 B8	15:56 9.77 AG+16 499 8.50 KU 0:17 8.70 HD 290779 10.82 A3	-10:26 5.76 HD 37808 6.45 B9.51IIs	- 6:54 6.00 Blend 7.40 BZV,AU - 8:14 11.21	- 3:45 6.48 HD 37887 7.67 A0V	- 2:16 3.79 Blend 6.92 B1.5V,A5 9.48 6.55 Blend 6.96 A0IV.7V B0	5:52 5.62 AG+05 654 9.30 F5	14:07 7.60 —— HD 37981 6.73 K1IV	- 8:06 10.18 HJ 38023 8.86 B4V 9:99 6.94 6.60 HJ 37958 6.68 B8	11:06 5.09 AG+11 563 9.50 F5	- 4:38 8.78 HD 38051 8.53 B8 5.17 7.07 6.06 HD 38022 8.17 R0	- 2:19
	a1950 61950 m1367 m1519 Identification V Sp. Type N	5:36:35 - 0:23 5.26 Blend 9.4P K7,7 5:36:38 11:09 8.13 AG+11 556 8.80 A0	$5:36:53$ 0:30 6.54 $\longrightarrow$ HD 290715 10.0P F5	5:36:53 9:30 7.89 AG+09 5/4 8:50 AU 5:37:12 4:26 7.15 7.00 HD 37591 8:01 B9	5:37:12 - 6:37 7.25 Blend 9.27 F8,A5	5:37:12 - 3:19 6:97 HD 37642 8:04 B9 5:37:18 - 9:42 5:49 HD 37635 6:50 B7V	5:37:20 0:55 8.17 7.51 Blend 7.83 A0,A0	5:37:21 1:32 6.02 0.43 HJ 37692 0.90 D8V 5:37:39 11:17 6.34 HD 37692 8.01 B3Vn	5:37:38 - 1:30 5.03 4.39 Blend 6.51 A2,B3Vn	5:37:39 - 0:45 9.23 HJ 2307.98 10.36 AZ 5:37:39 - 2:30 6.33 5.49 Blend 7.40 B5,B9	5:37:43 - 4:25 6.83 HD 37700 7.90 B6V	3:3(:40 - 3:20 0.40 Dicitit 0.00 Do,D3 5:38:03 - 3:56 9.14 HD 37745 9.18 A0.	5:38:03 - 2:49 4.38 Blend 6.02 B1.5V,A0	5:38:11 - 2:01 0.18 0.28 Blend 0.99 091ab;,09.51b 5:38:15 9:14 5.74 — Blend 7.32 B8.A0	5:38:17 16:30 3.31 Blend -0.02 B3IV,B3V,B4V	5:38:21 - 1:09 2.62 5.11 п.D 5/100 4.90 Б2IV-V 5:38:21 - 1:33 4.68 3.62 HD 37776 6.98 B2IV	5:38:23 8:28 8.55	5:38:24 0:33 6.73 —— HJ 290775 10.32 A2 5:38:29 - 8:01 —— 9.78 HD 37846 8.05 A0	5:38:29 - 3:38 6.10 HD 37807 7.90 B8	5:38:32 15:56 9.77 AG+16 499 8.50 KU 5:38:37 0:17 8.70 HD 290779 10.82 A3	5:38:39 -10:26 5.76 HD 37808 6.45 B9.5111s	5:38:42 - 6:54 6.00 Blend 7.40 BZV,AU 5:39:00 - 8:14 11.21	5:39:03 - 3:45 6.48 HD 37887 7.67 A0V	5:39:04 - 2:16 3.79 Blend 6.92 B1.5V,A5 5:30:16 9:48 6.55 Blend 6.92 B1.5V,A5	5:39:20 5:52 5.62 AG+05 654 9.30 F5	5:39:31 14:07 7.60 —— HD 37981 6.73 K1IV	5:39:52 - 8:06 10.18 HJ 38023 8.86 B4V 5:30:53 9:99 6.94 6.69 HD 37958 6.68 B8	5:40:02 11:06 5.09 AG+11 563 9.50 F5	5:40:03 - 4:38 8.78 HD 38051 8.53 B8 5:40:15 5:17 7 02 6 06 HD 38022 8 17 B0	5:40:26 - 2:19 6:37 HD 38087 8:28 B5V 5:40:26 10:53 7.86

TABLE 1—Continued

	Note	υ												υι	د											
	Sp. Type	A0 B9 A0V	B9,B8,A0 A0V	A,A2V,A0V A2	B9,B8 F8	A0 A5meA0	A0 Rg R3V	AIVs	2W,0M	A0,B9 B8IIIn	K0	A3, B9 A0, A2	A6m B9	B9V	400	B8 A 0	AU F5,F5	B8 Å	AU	A0	AZ B8V.A0	B8	AIV DAV AEV	B9V,A3V An	A0Vs	B8 A0
	2	8.50 9.20 8.70 8.20	7.89 6.90	8.16 9.20	8.94 9.70	9.20 5.61	8.70	5.22	07.0	8.38 6.62	8.70	7.53	5.03 6.50	02.7	<b>P</b>	8.20	7.81	7.40	00.1	9.20	8.00 6.23	7.95	8.40	8.19 7.15	6.08	8.40 7.00
	Identification	AG-01 660 HD 40118 HD 40134 AG-01 661	Blend HD 40210	Blend BD-08 1267	Blend AG+05 694	HD 40348 Blend	HD 40429	HD 40446	Dielia	Blend HD 40574	HD 40618	Blend	HD 40536 HD 40571	HD 40635	171 00-DV	HD 40728	Blend	HD 40836	пл 4063/	HD 40903	HD 40914 Blend	HD 40963	AG-00 726	Blend HD 40008	HD 41076	HD 41121 HD 41176
	<b>m</b> 1519	8.61 10.28 10.36 8.19	2.06	7.96 9.09	8.76	9.28 9.04	8.58	5.98	8.74	8.07 6.24	9.38	7.76	8.20	12.7	01.1	7.56	00.01	6.70	9.83	8.97	9.92		9.28	8.57 6 50	0.0	6.66
	<b>m</b> 1367		6.72		7.74			000	0.09			8.09	96.9		6.25		8.05	6.66	1.04			7.11			6.78	6.82 7.36
	<b>6</b> 1950	- 1:55 - 7:36 - 3:11 - 1:17	9:41 12:58 - 0-06	0:17	- 1:56 5:42	- 2:39	- 2:12	0:25	9:22 - 8:12	- 4:25	10:8 -	- 2:26 3:58	- 9:32 12:41	- 0:38	10:51	- 7:34	- 3:5/ 7:42	3:09	2:52 5:46	- 3:58	- 3:45 1:34	7:47	- 0:12	0:58	11:46	6:05 8:40 - 2:35
pənı	<b>α</b> 1950	5:53:47 5:54:06 5:54:16 5:54:16 5:54:16	5:54:38 5:54:38	5:54:53 5:54:59	5:55:03 5:55:04	5:55:27	5:56:00	5:56:14	0:50:10 5:56:34	5:56:37 5:57:00	5:57:02	5:57:04 5:57:05	5:57:07 5:57:07	5:57:32	5:57:52	5:58:05	0:58:00 5:58:29	5:58:46	0:58:49 5:58:58	5:59:03	0:59:11 5-59-34	5:59:34	5:59:36	0:59:39 5-50-40	5:00:16	5:00:24 5:00:25 5:00:40
Conti	.o.	100	8668	888 888 888 888 888 888 888 888 888 88	505	202	60		213	515	919	218	519	125	38	524	229	227	23 28 25 28	230	12 E E	188	334	222 222	232	80.00
<u> </u>	Note		., ., .,															<u>ں</u>	., .,			<u>ر م</u>			υ υ	<u>د ده ده</u>
TABI	Sp. Type	B8,A0 B9,A0 K7 A0	B9 B9	B9 G5	G8III+ B8	B9 B9IV V	A 0 A 0	B9spe	AU B9,A2	$A2\dot{V}n$	B9	B9 A2V	B9 B5	06:pe,A0,A2	AU B1.5V	B9	B9V A0	A0	A0 A0	B9	A0 B5	A0V.A4V	A2111,A0	A0	A2 A0	A0IV A0V B8
TABI	1 V Sp. Type	7.11 B8,A0 7.39 B9,A0 8.8P K7 7.62 A0	9.40 AU 7.42 B9	6.75 B9 8.80 G5	5.98 G8III+ 9.12 B8	8.40 B9 5.5 B91V V	8.30 A0	5.59 B9spe	8.31 AU 8.34 B9,A2	5.97 A2Vn	9.41 B9	7.09 B9 6.59 A2V	7.14 B9 8 c1 Bc	6.92 06:pe,A0,A2	8.70 AU 6.57 B1.5V	6.80 B9	9.20 B9V 9.20 A0	10.00 A0	8.20 A0 9.50 A0	7.90 B9	8.00 A0 8.17 BF	9.01 A0V.A4V	5.86 A2III,A0	8.30 A0	8.50 A0	5.99 A0IV 7.60 A0V 8.07 B8
TABI	Identification V Sp. Type	Blend 7.11 B8,A0 Blend 7.39 B9,A0 BD+13 994 8.8P K7 HD 33000 7.62 A0	BD-00 1098 9.40 AU HD 39082 7.42 B9	HD 39098 6.75 B9 HD 39068 8.80 G5	HD 39118 5.98 G8III+ HD 39103 9.12 B8	AG+08 662 8.40 B9 4D 20201 6.25 B91V V	AG+03 713 8.30 A0	HD 39317 5.59 B9spe	HD 39348 8.31 AU Blend 8.34 B9.A2	HD 39421 5.97 A2Vn	HD 39614 9.41 B9	HD 39647 7.09 B9 HD 39662 6.59 A2V	HD 39683 7.14 B9 HD 30716 8 51 B5	Blend 6.92 06:pe,A0,A2	HD 39777 6.57 B1.5V	HD 39773 6.80 B9	HD 39803 9.20 B9V RD-07 1911 9.20 A0	AG-02 171 10.00 A0	AG+04 671 8.20 A0 BD-02 1405 9.50 A0	HD 39907 7.90 B9	HD 39852 8.00 A0 HD 30889 8.17 B5	Blend 9.01 A0V.A4V	Blend 5.86 A2III,A0	AG+07 683 8.30 A0 HD 20840 7 20 A2	HD 39957 8.50 A0	HD 39985 5.99 A0IV HD 39953 7.60 A0V HD A0011 8.07 B8
TABI	m1819 Identification V Sp. Type	5.98 Blend 7.11 B8,A0 7.86 Blend 7.39 B9,A0 <u>6.87</u> HD 39000 7.62 A0	9.24 BD-00 1098 $9.40$ A0 8.77 HD 39082 $7.42$ B9	HD 39098 6.75 B9 HD 39068 8.80 G5	7.37 HD 39118 5.98 G8III+ 7 90 HD 39103 9.12 B8		8.31 AG+03 713 8.30 A0	HD 39317 5.59 B9spe	8.18 HD 39348 8.31 A0 8.84 Blend 8.34 B9.A2	7.74 HD 39421 5.97 A2Vn	10.06 HD 39614 9.41 B9	7.58 HD 39647 7.09 B9 HD 39662 6.59 A2V	HD 39683 7.14 B9 7 34 HD 30716 8 51 B5	Blend 6.92 06:pe,A0,A2	9.28 HD 39635 8.70 AU 4.88 HD 39777 6.57 B1.5V	6.76 HD 39773 6.80 B9	8.62 HD 39803 9.20 B9V 10.70 RD.07 1911 9.20 A0	8.90 AG-02 171 10.00 A0	9.06 AG+04 671 8.20 A0 9.25 BD-02 1405 9.50 A0	HD 39907 7.90 B9	8.86 HD 39852 8.00 A0 HD 30869 8.17 B5	8.11 Blend 9.01 A0V.A4V	7.16 Blend 5.86 A2III,A0	AG+07 683 8.30 A0	9.34 HD 39957 8.50 A0	
TABI	m <sub>1367</sub> m <sub>1619</sub> Identification V Sp. Type	5.84 5.98 Blend 7.11 B8,A0   7.23 7.86 Blend 7.39 B9,A0   5.96 T.13 994 8.8P K7   6.81 6.87 HD 39000 7.62 A0		6.26 HD 39098 6.75 B9 7.77 HD 39068 8.80 G5	7.83 7.37 HD 39118 5.98 G8111+ 	8.52	8.33 8.31 AG+03 713 8.30 A0	8.43 6.99 HD 39317 5.59 B9spe	8.18 HD 39348 8.31 AU 8.84 Blend 8.34 B9.A2	7.74 HD 39421 5.97 A2Vn	0.00 10.06 HD 39614 9.41 B9	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	7.44 —— HD 39683 7.14 B9 7.24 HD 30716 8.51 B5	6.19 Blend 6.92 06:pe,A0,A2	9.28 HD 39635 8.70 AU 4.88 HD 39777 6.57 B1.5V	6.75 6.76 HD 39773 6.80 B9	8.62 HD 39803 9.20 B9V	8.90 AG-02 171 10.00 A0	9.06 AG+04 671 8.20 A0 9.25 BD-02 1405 9.50 A0	7.26 HD 39907 7.90 B9	8.86 HD 39852 8.00 A0 е 79 HD 30669 6 17 В5	8.11 Blend 9.01 A0V.A4V	7.16 Blend 5.86 A2III,A0	9.04 AG+07 683 8.30 A0	9.02 HD 39957 8.50 A0	6.53 HD 39885 5.99 A0IV 8.04 HD 39953 7.60 A0V 8.84 HD 30011 8.07 HS
TABI	61950 m1367 m1619 Identification V Sp. Type	0:41 5.84 5.98 Blend 7.11 B8,A0 4.13 7.23 7.86 Blend 7.39 B9,A0 13:17 5.96 BD+13 994 8.8P K7 - 0:46 6.81 6.87 HD 39000 7.62 A0	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	2:00 7.83 7.37 HD 39118 5.98 G8III+ 1.42	8:35 8.52 AG+08.062 8.40 B9 7.00 7.00 7.00 10 10 10 10 10 10 10 10 10 10 10 10 1	- 1:29 3.03 nJ 35291 3.09 D21 V-V 3:47 8.33 8.31 AG+03 713 8.30 A0	- 0.53 8.43	- 7:55 8.18 HD 39348 8.31 AU - 6:50 8.84 Blend 8.34 B9.A2	- 9:01 7.74 HD 39421 5.97 A2Vn	-6:25 10.06 HD 39614 9.41 B9	- 5:43 7.58 HD 39647 7.09 B9 11:49 8.09 HD 39662 6.59 A2V	8:10 7.44 —— HD 39683 7.14 B9 6:44 7.34 HD 30716 8.51 B5	13:54 6.19 Blender 6.92 06:pe,A0,A2	-10:41 9.28 HJ 39635 8.70 AU - 4:07 4.88 HD 39777 6.57 B1.5V	5:55 6.75 6.76 HD 39773 6.80 B9	- 0:19 8.62 HD 39803 9.20 B9V - 7:30 10.70 RD-07 1211 9.20 A0	- 2:01 8.90 AG-02 171 10.00 A0	4:41 9.06 AG+04 671 8.20 A0 - 2:25 9.25 BD-02 1405 9.50 A0	11:35 7.26 HD 39907 7.90 B9	- 9:09 8.86 HD 39852 8.00 A0	0:44 8.11 Blend 9.01 A0V.A4V	- 4:50 7.16 Blend 5.86 A2IIÍ,A0	7:57 9.04 AG+07 683 8.30 A0	- 1:30 3:02 HD 39957 8.50 A0	9:36 6.53 —— HD 3985 5.99 A0IV 0:42 —— 8.04 HD 3993 7.60 A0V 3.53 —— 8.64 HD 3093 7.60 A0V
TABI	a1960 61960 m1367 m1,819 Identification V Sp. Type	5:46:15 0:41 5.84 5.98 Blend 7.11 B8,A0 5:46:26 4:13 7.23 7.86 Blend 7.39 B9,A0 5:46:58 13:17 5.96 BD+13 994 8.8P K7 5:47:00 - 0:46 6.81 6.87 HD 39000 7.62 A0	5.47.23 - 0.16 - 9.24 BD-00 1098 9.40 A0 5.47.26 4:54 - 8.77 HD 39082 7.42 B9 5.47.26 2.91 5.90	5.47.20 $3.31$ $5.00$ $$ HD 39098 $6.75$ B9 5.47.32 $14.27$ $6.26$ $$ HD 39098 $6.75$ B9 5.47.32 $1.15$ $7.77$ HD 39068 $8.80$ $G5$	5.47:54 2:00 7.83 7.37 HD 39118 5.98 G8III+ 5.47:57 1.42 7.00 7.89 HD 39103 9.12 R8	5:41:08 1:35 8:52 AG+08.662 8:40 B9 5:40:08 8:35 8:52 AG+08.662 8:40 B9 2.40:08 0:00 2 63 HD 20001 5 5 P3UV V	5:46:50 3:47 8.33 8.31 AG+03 713 8.30 A0	5:49:07 - 0:53 8.43 5:49:08 14:12 6.99 HD 39317 5.59 B9spe	5:49:13 - 7:55 8.18 HJJ 39348 8.31 AU 5:49:40 - 6:50 8.84 Blend 8.34 B9.A2	5:49:49 - 9:01 7.74 HD 39421 5.97 A2Vn	5:50:53 - 6:25 10.06 HD 39614 9.41 B9	5:51:01 - 5:43 7.58 HD 39647 7.09 B9 5:51:09 11:49 8.09 HD 39662 6.59 A2V	5:51:17 8:10 7.44 —— HD 39683 7.14 B9 5:51:24 6:44 — 7.34 HD 30716 8:51 B5	5.51:30 13:54 6.19A0, 200 06:pe,A0,A2	5:51:52 -10:41 9.28 HJ 39650 8.70 AU 5:51:52 - 4:07 4.88 HD 39777 6.57 B1.5V	5:51:52 5:55 6.75 6.76 HD 39773 6.80 B9	5:52:16 - 0:19 8.62 HD 39803 9.20 B9V 5:52:91 - 7:30 10.70 RD-07 1211 9.20 A0	5:52:30 - 2:01 8.90 AG-02 171 10:00 A0	5:52:37 4:41 9.06 AG+04 671 8.20 A0 5:52:39 - 2:25 9.25 BD-02 1405 9.50 A0	5:52:42 11:35 7.26 HD 39907 7.90 B9	5:52:44 - 9:09 8.86 HD 39852 8.00 A0 5:52.45 12:00 8.78 HD 2022 8.17 B5	5:52:45 0:44 8.11 Blend 9.01 A0V.A4V	5:52:51 - 4:50 7.16 Blend 5.86 A2IIÍ,A0	5:52:54 7:57 9.04 — AG+07 683 8.30 A0	5:53:09 - 7:26 9.34 HD 39957 8.50 A0	55:53:10 9:36 6.53 — HD 39985 5.99 A0IV 5:53:25 0:42 — 8.04 HD 39953 7.60 A0V 5:53:25 0:42 — 8.86 HD 30953 7.60 A0V

No.	<b>a</b> 1950	61950	<b>m</b> 1367	<b>m</b> 1519	Identification	Л	Sp. Type	Note N	·.	<b>α</b> 1950	<b>6</b> 1950	<b>m</b> 1367	<b>m</b> 1519	Identification	4	Sp. Type	Note
541	6:00:40	4:18 6.30	06 30	9.23	AG+04 693	8.20	A0	20.22	86 6 87 6	:07:18 -07:25	6:17		8.07 8.84	Blend HD 42335	8.67 8.41	B3V,A0,A A0	
543 543	6:01:13	2:45		6.10	HD 41253	7.31	B5	526	. 88	:07:32	2:54		6.61	HD 42353	6.90	B9	
544 545	6:01:23 6:01:24	- 3:52 3:06		12.36 7.26	HD 41272 AG+03 733	$9.50 \\ 10.30$	A0 K2	2 22	90 69 90 69	:07:35 :08:16	3:56 - 2:48		8.15 9.42	AG+03 752 HD 42482	8.20 9.10	B9 A0	
546	6:01:33	2:01		8.98	HD 41287	9.20	A0	<u>ي</u>	91 6	:08:32	1:55		0.00	HD 42533	8.00	A0	υ
547	6:01:34	0:30		8.34	HD 41288	8.80	A0 D91/22	ις Γ	93 93	:08:34	. 3:40 9.65		9.07	Blend	8.45 7.63	AU,AU A3 A0 A0 A0	
549 549	6:01:52	- 0:41 9:40	7.81	16.6	Blend	8.07	A0.A	ñ 10	94 94 6	:08:47	3:26		8.25	HD 42563	8.89	B9	
550	6:01:59	- 1:40		8.28	HD 41381	6.80	A0	20	95 6	:08:51	2:01		8.66	AG-01 691	8.90	A0	U
551	6:02:10	9:03	8.13		HD 41378	8.19	A0 P0	20.7	9090	:08:55	0:47		8.02	HD 42602	8.30	A0 A0 A3	
552 552	6:02:11	2:02		9.93 0 79	AG+02 0/3 HD 41421	00 <sup>-</sup> /	D9	0 0	0 80 98	-00-00	2:20		0.29	Diena	00.1	AU,A2	
554 554	6:02:25	- 5:22		8.72	HD 41434	7.90	B9	5 10	9 66	:09:13	0:42		8.35	HD 42638	8.30	A0	
555	6:02:27	5:51	7.14	7.58				96	90	:09:20	1:21		7.98	Blend	7.54	B8,A0	
556	6:02:54	- 1:20		8.78 0 55	HD 41503	9.00 0 0 0	A2 A0 A9 A0	99.9	01 6 6	:09:22	- 4:40 6.21		5.78 3.91	HD 42657 HD 49600	6.18 5.05	B9mnp R9V	
558 558	6:03:28	- 4:4/ - 6:19		0.00 77.8	Diena HD 41583	8.60	A0,A2,A0 B9	<u>5</u> <u>5</u>	9 13 10 10	-09:57	0:51		9.39	02075 711	0.0		. '
559	6:03:29	- 4:35		8.55	Blend	8.26	A0,B9	9	04 6	:10:05	3:36		6.59	HD 42845	7.51	B8	
560	6:04:03	- 4:14		4.68	HD 41692	5.39	B5ÍV	9	05 6	:10:09	2:54		8.79	HD 42846	8.48	A0	
561	6:04:03	5:29	ł	9.43				90	90	:10:12	- 2:31		7.90	HD 42824	6.63	A2V	
562	6:04:06	2:06		7.97	HD 41715	7.70	A0	90	9 20 00 6	:10:18	0:44		7.80	AG+00 636	8.50	AU AO	υ
564 564	0:04:10 6-04-19	- 0:19		0.53 0.53	HD 41755	00.0	AU	õ ē	0 9 0 0	:10:35	- 3:40 0:34		8.00 8	AG+00 638	8.30	AD	U
565	6:04:20	- 3:24		5.89	HD 41756	6.92	B5	9	10 6	:10:35	0:08		7.38	HD 42877	8.40	B8	
566	6:04:30	3:03		7.70	HD 41808	7.70	A0	9	11 6	:11:07	2:17		7.24	HD 42959	7.79	B8	
567	6:04:40	- 1:00		8.10	HD 41810	8.90	A0	9	12 6	:11:09	- 1:55		10.13	Blend	8.6P	A3,A0	
568	6:04:42	- 2:01		8.41	AG-01 679	8.20	A0 D0 42	99	13	:11:19	1:05		7.73	Blend	7.6P	A0,A2,B8	
509 570	0:04:09	20:0		0.00	DIEDO	00	D9,A2 D0		14 14 14	20:11:	2:44 2.10		0.00 6 20	Diella HD 42112	00.1	AU,A2 R0	
571	0:00:02	90:0 -		9.00 10.70	HD 201204	0.40 10.0P	55 24		0 9 19	12.16	0.24		8.33	HD 43191	8.10	A0	
572	6:05:21	3:22		7.49	Blend	7.33	A0,A0	9	17 6	:12:22	4:33		4.25	HD 43157	5.83	B5V	
573	6:05:31	- 3:51		11.28	HD 294670	9.00	K5	9	18 6	:12:23	2:57		11.50	HD 43193	8.80	AO	
574	6:05:35	- 7:07		8.81	HD 41950	8.60	A0	9.6	19 6	:12:56	0:51		6.38	Blend	6.78	B5,B9	
575	6:05:36	- 2:38		9.43	Blend	8.1.9	A0,A	64	0 7 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	12:35	2:15 10:0		8.82 6.62	blend	8.4F 7 16	AU,AZ De A9	ţ
5/0 577	0:U3:43	- 2:02		9.00 7 82	SAO 139867	0.65	AU,A B1 5V	2	13 13 13 13	-13-45	10.0		6 13	HD 43461	6 62	B6V	ر
578	6:05:59	- 5:20		6.59	SAO 132876	8.10	BIV	66	9 18	:13:48	2:51		8.88	HD 43462	8.00	A0	
579	6:06:08	2:28		6.94	Blend	4.67	A0,A3Vn,A0	<u>;;</u>	24 6	:14:23	0:04		7.60	AG-00 765	8.60	B8	υ
580	6:06:12	- 6:30		8.83	SAO 132875	8.90	B3		25 6	:14:26	3:25		8.60	BD-03 1368	8.60	K5	
301 582	6:06:34	3:42		8.94 8.94	Blend	8.37	D0 A0.A2										
583	6:06:45	- 7:52		16.7	HD 42133	6.70	A2										
584	6:06:48	- 3:50		7.02	HD 42204	8.45	B5										
585	6:07:04	0:55		8.08	HD 42257	7.60	B9										
a T	hie etor	hoe o no		1 midtin	om si deidu. 'C	nodt or											
- L q	his star	has a ne has a ne	viohhor v	within 1	2 which is mo	ue than	1 mag taluler III	une uu in the	11 troi	cl. riolet							
L°.	his star	has a ne	ighbor w	vithin 1	2' which is wit	hin 1 n	i ag of the same	ultravi	olet b	rightnes	Ś						
Lp	his star	is a mer	nber of ]	NGC 15	977.		)			2							
Ĵ	Itraviole	et magn	itudes ui	ncertain	n due to the bri	ightnes	of this star.										
Γ,	his obje	ct coinci	ides with	1 severa	l faint F, G, ar	ıd K sti	ITS.										

TABLE 1—Continued



FIG. 3.—Color-color plots for stars for which we have measured both ultraviolet magnitudes and for which a V magnitude is available. Three stars fall well outside of the plotted areas.



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FIG. 5.—The frequency distribution of stars in our selected sample as a function of spectral type.



FIG. 6.—Plots of  $(m_{1367} - V)$  and  $(m_{1519} - V)$  against the V magnitude for stars from the selected sample with spectral types of B8, B9, A0, A1, and A2. The solid diagonal lines represent the limiting magnitudes of our ultraviolet photometry.

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### SCHMIDT & CARRUTHERS

In Paper I we argued that the stars in the lower right corner of the color-magnitude diagram are likely to be hot white dwarfs due to their combination of very blue colors and faint visible manitudes. Stars 143, 161, 172, 213, 240, 291, and 386 appear in that group in one or both of the plots in Figure 6. The first two of these objects have spectral types of B9V. This is inconsistent with their being white dwarfs and with their positions in Figure 6. It is thus likely that the sources of the ultraviolet radiation are not the B stars. The other five objects do not have MK spectral types and are possible white dwarfs. There are no doubt more such stars which were not included in Figure 6 because they lacked optical data.

We have searched in the white dwarf catalog of McCook & Sion (1987) for the stars listed in the previous paragraph. None of them are in the catalog. On the other hand, there are nine stars in the catalog which are in our field. While none of them correspond to any of our ultraviolet objects, they are all faint and might lie below our detection threshold in the ultraviolet.

The objects we have identified as white dwarfs, those we have identified with late-type stars and those for which we have no identification should all be investigated further. Since the accuracy of the ultraviolet coordinates is no better than a few minutes of arc, the identifications in Table 1 are somewhat uncertain. The inspection of the region on objective prims plates and the measurement of colors of stars in the vicinities of the ultraviolet objects would both be useful in addressing these points. CCD observations are planned for this purpose.

We thank H. M. Heckathorn, B. C. Dohne and D. E. Reiswig for assistance in the data analysis and useful discussions. We also acknowledge contributions by C. B. Opal (deceased) to the experiment planning and development and by David King and H. Merchant (deceased) in preflight technical support. The *IUE* Regional Data Analysis Facility at Goddard Space Flight Center and the SIMBAD database, operated by CDS, Strasbourg, France, were used in this research.

REFERENCES

(Dordrecht: Kluwer)

Carruthers, G. R., & Opal, C. B. 1977a, ApJ, 212, L27

- ------. 1977b, ApJ, 217, 95 Carruthers, G. R., & Page, T. 1983, ApJS, 53, 623

- ------. 1984c, PASP, 96, 447

McCook, G. P., & Sion, E. M. 1987, ApJS, 65, 603 Schmidt, E. G., & Carruthers, G. R. 1993, ApJ, 408, 489 (Paper I) Sharov, A. S. 1964, Soviet A&A, 7, 689 (AZh, 40, 900 [1962]) Sterken, C., & Manroid, J. 1992, Astronomical Photometry, A Guide

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. 89.



FIG. 2.—Print of an image of the 1982 field. The rings and arcs near field center are instrumental artifacts.

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## PLATE 9



FIG. 9.—Samples of four position-position continuum-subtracted images shown in gray scale. The display is linear: emission appears white, absorption appears black. Clockwise from upper left:  $V_{LSR} = -46.5, -59.1, -23.4, \text{ and } -72.4 \text{ km s}^{-1}$ .

HEILES, MCCULLOUGH, & GLASSGOLD (see 89, 284)

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