

THREE NEW SOUTHERN EMISSION-LINE LATE-TYPE DWARFS

GRAY, R.O.; MCFADDEN, M.T.

Appalachian State University, Boone, NC, U.S.A., e-mail: grayro@appstate.edu

As part of the NASA Nearby Stars / Space Interferometry Mission Preparatory Science program, we are obtaining classification resolution spectra of all 3600 dwarf and giant stars earlier than M0 within 40 pc of the Sun in the *Hipparcos* catalog (Perryman 1997). While our sample only extends to stars earlier than M0, we have included in our program stars from the *Hipparcos* catalog out to 40 pc which have no known spectral type. Many of these stars are M-type dwarfs. During an observing run in early February 2001 at the Cerro Tololo Interamerican Observatory, we obtained spectra of the fainter southern stars in our program on the 1.5-m telescope with the Cassegrain spectrograph. The spectra are of resolution 2.6 \AA (2 pixels), with a spectral range from 3800–5150 \AA . During the observing run, we also obtained spectra of a number of late-type MK standards.

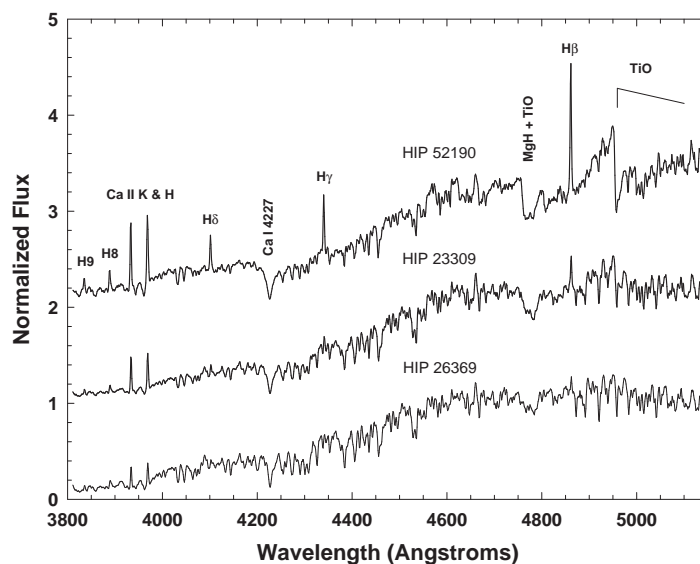


Figure 1. Spectra of three new southern emission-line stars. The fluxes have been normalized at a common point, and the spectra offset by one flux unit for clarity

Table 1: Data for new emission-line dwarfs

JD 2450000 +	Star	Spectral type	EW (\AA) Ca II K	V	Parallax (mas)	Error (mas)
1947.833	HIP 52190	M2 Ve	11.6	11.02	68.38	3.76
1948.566	HIP 23309	K7 Ve	9.8	10.02	38.08	1.07
1945.569	HIP 26369	K4.5 Ve	5.8	9.84	41.23	15.54

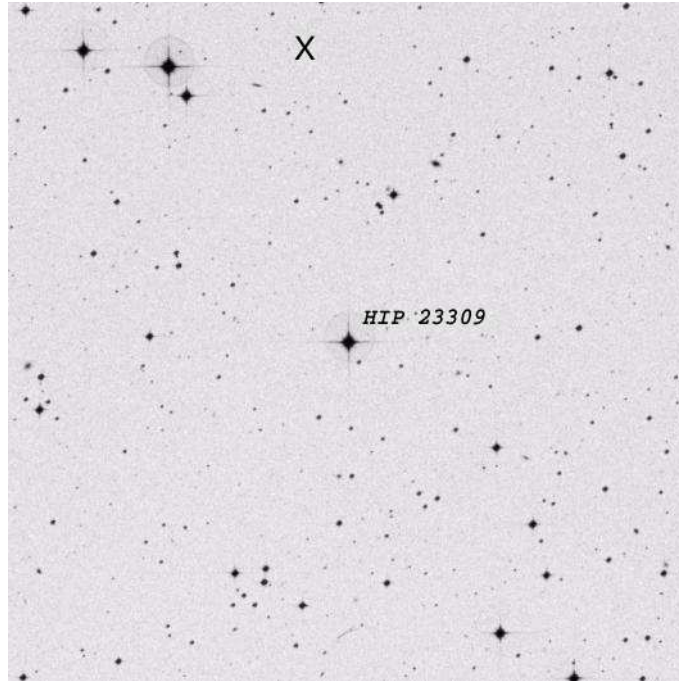


Figure 2. A finding chart for HIP 23309, a newly discovered emission-line star. The catalog position for the star UGP 105 is indicated by an ‘X’ at top center. The chart is $15' \times 15'$. North is at top, east is to the left. The brightest star in the upper lefthand corner is CD $-57^{\circ}1055$ which, according to Simbad, has a spectral type of F8

Two of the stars, HIP 52190 and HIP 23309 (CD $-57^{\circ}1054$), on our program show prominent emission lines in Ca II K & H and the Balmer lines, (see Figure 1) but seem not to have been recorded as emission line objects in the literature. The third star, HIP 26369, also illustrated in Figure 1, turns out to be a chromospherically-active companion to a very active primary.

HIP 52190 shows strong Balmer-line emission as well as strong emission in Ca II H & K. The total exposure time for our spectrum was 1600 seconds, distributed over 4 separate exposures. The individual exposures, however, do not reveal a change in the emission-line strengths, and thus, if this is a flare star, the spectrum in Figure 1 likely represents the quiescent state. We can find no reference to this high proper motion star as a flare or emission-line star in the literature. Its *Hipparcos* parallax places it at a distance of 14.6 parsecs, but it was not included in the Catalogue of Nearby Stars (Gliese & Jahreiss 1991). This star was discovered by *Hipparcos* to be a binary with a separation of $1''32$.

HIP 23309 shows moderately strong emission in $H\beta$ and quite strong emission in Ca II

H & K. The Simbad Database records a spectral type of K7 V for HIP 23309, but we can find no other spectral type for this star in the literature, nor any reference to this star as an emission-line star. The source for the K7 V spectral type is a compilation by Jaschek (1978), but the coordinates in that compilation do not correspond to the *Hipparcos* position for HIP 23309, but to the star UGP 105 in the Uppgren et al. (1972) catalog. UGP 105 is given a spectral type of K7 V in the Uppgren et al. catalog, and thus it seems likely that HIP 23309 has been confused with UGP 105. Simbad gives a position for UGP 105 a few minutes north of the position of HIP 23309, but it is listed as having a V magnitude of 9.2, considerably brighter than $V = 10.02$ assigned to HIP 23309 in the *Hipparcos* catalog. However, no star occurs at the position of UGP 105! To help clarify this situation, we include a finding chart for HIP 23309 (Figure 2).

A third star of interest is HIP 26369 (HD 37572 B) which shows fairly strong emission in Ca II H & K. This star makes a wide visual binary ($18.3''$ separation) with a well-known chromospherically active star, HD 37572 (UY Pic) which is both a *ROSAT* (Pounds et al. 1993) and *Extreme Ultraviolet Explorer* (Bowyer et al. 1994) source. No spectral type for HIP 26369 shows up in the Simbad Database, and a search of relevant catalogs and references was unsuccessful. Our spectrum of HIP 26369 is displayed in Figure 1.

We have used our spectra to classify these stars on the MK system. This information is presented in Table 1. Photometry and parallaxes in Table 1 are from the *Hipparcos* catalog.

This research is supported under NASA/JPL Contract #1219099. Spectra obtained for this project are released on our NStars website: <http://stellar.phys.appstate.edu/>. This research made use of the SIMBAD database, operated at CDS, Strasbourg, France. Figure 2 was prepared from the Digitized Sky Survey which is based on images taken for the SERC-J survey, Royal Observatory Edinburgh. Cerro Tololo Interamerican Observatory is operated by the Association of Universities for Research in Astronomy, Inc., under contract with the National Science Foundation.

References:

- Bowyer, S., et al., 1994, *ApJS*, **93**, 569
Perryman, M.A.C., et al., 1997, *A&ALett*, **323**, 49
Gliese, W. & Jahreiss, H., 1991, Preliminary Version of the Third Catalogue of Nearby Stars, Astron. Rechen-Institut, Heidelberg
Jaschek, M., 1978, *CDS Inf. Bull.*, **15**, 121
Pounds, K.A., et al., 1993, *MNRAS*, **260**, 77
Uppgren, A.R., Grossenbacher, R., Penhallow, W.S., MacConnell, D.J., & Frye, R.L., 1972, *AJ*, **77**, 486