

STUDIES OF O-F5 STARS AT THE GALACTIC POLES

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We report progress on a spectroscopic and photometric programme devoted to the study of the dynamics of O-F5 stars within 15° of the North and South Galactic Poles. The aims of the programme are to test dynamical and chemical evolution models of the Galaxy by establishing velocity dispersions as a function of z-distance for stars of different population groups. We are also able to investigate the interstellar reddening at the poles and the kinematic properties of apparently normal early-type stars found more than 1 kpc from the galactic plane.

An initial survey of ~ 300 stars at the NGP was completed in 1976 and a discussion of the observed and dynamical local mass densities was published by Hill et al. (1979 and see refs. therein). This survey was extended to include all O-F5 stars within 15° of the NGP in the AGK3 catalogue and the objective-prism survey of Slettebak and Stock (1959). At the SGP, we initiated a survey of all HD stars in that spectral-type range.

Completed uvby β photometry of a further ~ 700 stars at the NGP is now published (Hill & Barnes 1982a,b) together with a catalogue of cross-reference star names and positions (Hill 1982) and a catalogue of derived intrinsic colours, distances and classifications (Hill et al. 1982a). A reddening map together with an intrinsic-colour calibration for B9-A3 stars is given by Hilditch et al. (1983). This map refines the original 1976 data and confirms the zero point of the HI/GC method of Burstein & Heiles (1982) for determining total interstellar extinction through the Galaxy at intermediate and high latitudes. At the SGP, uvby β photometry of 572 O-F8 stars has been completed by McFadzean et al. (1983). Interstellar reddening has been shown to be negligible and a number of horizontal-branch stars, subdwarfs etc have been identified.

Combining the uvby β photometry on these ~ 1600 stars at the galactic poles has allowed us to study the relative proportions of intermediate- and halo-population II stars (as defined by Stromgren 1966) as a function of z-distance (Table I). These data show essentially constant relative proportions of ipII and pII stars out to ~ 400 pc, after which they begin

to increase. This result reflects the scale height of the population I disk stars.

Spectroscopic observations (at 30 and 80 \AA mm^{-1}) are now completed (~ 3 spectra per star) for the ~ 1000 NGP stars and for ~ 300 SGP stars. The determination of radial velocities from these spectra is being carried out using an interactive graphics package REDUCE (Hill et al. 1982b) and we expect these velocities to be completed by mid-1984.

Table 1
Relative proportions of population groups

distance (pc)	A stars		F stars	
	ipII/pI	pII/pI	ipII/pI	pII/pI
0- 100	0.04	0.00	0.12	0.02
101- 200	0.03	0.01	0.08	0.01
201- 300	0.03	0.00	0.07	0.02
301- 400	0.00	0.00	0.10	0.02
401- 500	0.04	0.00	0.25	0.04
501-1000	0.16	0.01	0.44	0.06

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