SPECTRAL CHARACTERISTICS OF EARLY G-DWARF STARS TOWARDS THE GALACTIC POLES

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We have obtained slit spectra of 299 candidate early G-dwarf stars from the objective prism and photometric surveys of Corbally and Garrison (1988a, 1988b) in the North and South Galactic Pole regions between 90 and 1700 pc from the sun. The slit spectra from reticon detectors on the S.A.A.O. 1.9 m and the Steward Observatory 2.3 m telescopes have a resolution of 2 Å and a signal-to-noise of around 35.

The spectra were classified against those of MK standards according to the methodology of Corbally (1987) which copes with weak-line spectra. That paper also describes the metallicity index, Δ_m, which is the numerical difference in spectral subtypes between the hydrogen line strength and the metallic line strength shown by a star.

Initial results show that 277 out of the 299 candidate stars are indeed dwarfs and so form a very homogeneous and unambiguous set of Galactic probes. One dwarf star is slightly strong-lined, while 28% and 7% have metallicities corresponding to intermediate ($\Delta_m > -10$) and extreme ($\Delta_m \leq -10$) Population II stars respectively. The remaining 65% have solar like abundances and are generally very normal looking. The most extreme weak-lined stars are CG-SGP-106 with a type of "K0 mF2" and CG-SGP-184 with "G5 mA6". These spectra are so weak-lined as to make luminosity determination uncertain.

No significant difference in the distribution of metallicities was detected between the north and south directions, nor did this distribution skew obviously with distance from the Galactic plane. If thin-disk stars outnumber halo/thick-disk stars up to a height of 2 kpc (Croswell *et al.* 1991), then these are expected results for this G-dwarf sample.

Radial velocities, obtained by the cross-correlation method with $\sigma \simeq 8$ km/s, show that, when the NGP and SGP data are combined, the distribution of velocities is similar for the two Galactic poles, but that more G-dwarf stars (67%) are streaming southward. These results may simply imply that the Sun is near the plane of the Galaxy and has a *w* velocity of about +15 km/s.

References

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