

Near-Infrared Spectroscopy of High Galactic Latitude Carbon Stars – They Might Be Giants?

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Because of their high luminosity and distinctive optical spectra, carbon stars can be used as kinematic probes of the Galaxy to great distances (Bothun et al. 1991, *AJ*, 101, 2220). However, a number of faint carbon stars at high galactic latitudes (including three from the above work) show significant proper motion, suggesting a main-sequence luminosity. These carbon dwarf (dC) stars are generally believed to be binary systems in which the main-sequence dwarf has received processed material from a now invisible companion during the companion's ascent of the AGB. The optical spectra of dwarf and giant carbon stars are similar, and unambiguous discriminants such as proper motion can be problematic. Infrared spectra of a selection of faint carbon stars in the *J*, *H*, and *K* bands indicate that the known dC stars have weak first-overtone CO bands for their *H-K* color in comparison to the other stars in the sample and a selection of bright carbon giants. A similar segregation in the *J-H*, *H-K* plane was noted by Green et al. (1991, *ApJ*, 380, L31). The spectroscopic results are consistent with the suggestion of Green et al. that *JHK* colors, which are more easily obtained than proper motion or IR spectra, may provide a useful luminosity discriminant.