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Kinematics of nearby K-M dwarfs: first results

A.R. Upgren[1], R.P. Boyle[2], J. Sperauskas[3], and S. Bartašiūtė[3]

[1] Yale and Wesleyan Universities, Middletown and New Haven, Connecticut 06457, USA
e-mail: aupgren@wesleyan.edu
[2] Vatican Observatory Research Group, Steward Observatory, University of Arizona, Tucson, Arizona 85721, USA
[3] Vilnius University Observatory, Čiurlionio 29, Vilnius LT-03100, Lithuania

Abstract. The lists of stars selected spectroscopically by Vyssotsky at the McCormick Observatory and the 4th version of the Catalogue of Nearby Stars (CNS4) are two major sources of nearby K–M dwarfs, which complement each other and provide a kinematically unbiased sample of about 1400 such stars. With the addition of Hipparcos and Tycho astrometry, this stellar sample offers perhaps best insight on the kinematical properties of the lower main sequence stars in the immediate solar neighborhood. Until recently, however, the main limitation in observational data for this sample was the lack of well determined radial velocities, especially for fainter magnitude stars. Therefore our first goal was to perform radial velocity observations for one-third of the sample stars which had no accurate or any radial velocity data. Using the CORAVEL spectrometer of Vilnius University Observatory, attached to the 1.5-m NASA and 1.6-m Kuiper telescopes at Steward Observatory, US, and the 1.6-m telescope at Molėtai Observatory, Lithuania, radial velocities have been recently measured for 475 K–M dwarfs. These observations, together with previous radial-velocity data and available astrometry, are used to derive complete kinematical information on the sample stars. Preliminary analysis shows the presence of different age populations which dominate in different regions of the asymmetric drift: from the young disk component, showing no lag behind the rotational motion of the Sun, to the thick disk stars which make up an extended asymmetric tail. Assuming that the U and W velocity components have zero motion relative to the LSR, and that the asymmetric drift is proportional to σ_U^2, we find the peculiar motion of the Sun relative to the LSR $(U_\odot, V_\odot, W_\odot)$= $(9.3 \pm 1.3, 5.9 \pm 0.8, 6.9 \pm 0.7)$ km s^{-1}. No attempt was made at this stage of work to determine $V_\odot$ directly from the mean V-motion of the young disk stars. After completion of the radial-velocity program, the next step will be to evaluate the selection effects within the stellar sample. Hopefully, age related stellar measures will also be provided in a later phase of the program.

Key words. Stars: kinematics – Stars: late-type – Galaxy: solar neighborhood

Send offprint requests to: A. R. Upgren