ABSOLUTE FLUXES OF K CHROMOSPHERIC EMISSION ON THE H–R DIAGRAM

C. BLANCO, S. CATALANO* and E. MARILLI
Catania Astrophysical Observatory and Astronomical Institute, University of Catania, Italy

Abstract. Continuing our previous analysis of the chromospheric emission (Blanco *et al.*, 1974), absolute fluxes of the K emission line have been evaluated from 10 Å mm^{-1} spectrograms of the O. C. Wilson collection for 31 F5–K7 main sequence stars and 172 G2-M5 giants.

Our previous main results concerning the fluxes of main sequence stars are confirmed. Values for stars common to our previous and present set of data compare with one another within ±10%, apart from the values of 61 Cyg A, for which a scatter as large as ±20%, was found. These discordancies are discussed in terms of the accuracy of the data and of real variations.

The K line flux of giant stars is found to be about 10^5 erg cm^{-2} s^{-1} for early G type and decreases by two orders of magnitude from the spectral type G2 to M5. Differences in the flux are evident for giants earlier than K0, but no clear age dependence could be found. The average flux of giants is found to be lower by one order of magnitude than the flux of main sequence stars of the same spectral type.

The lines of iso-chromospheric emission on the H–R diagram are roughly vertical lines with a slight inclination to the left for earlier spectral type. In any case they display a rather different trend from the lines of iso-acoustic flux.

The ratio of K line flux to the bolometric flux $B(T)$ assumed as an index of the chromospheric activity shows a maximum at $T_{\text{eff}} \approx 4500$ K for giant stars, and at $T_{\text{eff}} \approx 5000$ K for main sequence stars.

Finally the observed decline in the equivalent width of K emission on giant stars later than M0 is discussed and interpreted in terms of circumstellar absorption.

Reference

Blanco, C., Catalano, S., Marilli, E., and Rodonò, M.: 1974, *Astron. Astrophys.* **33**, 257.

* Guest investigator at the Hale Observatories, Astronomical Institute of Catania University.

Bumba and Kleczek (eds.), Basic Mechanisms of Solar Activity, 473.