

Analysis of chromospheric flux-flux relationships of M Dwarfs using visible and near-infrared CARMENES spectra.

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Abstract

Exploiting the huge amount of data provided by the CARMENES survey, this work aims to study the chromospheric activity of M dwarfs based on a sub-sample (active RV-loud M dwarfs) of CARMENES GTO sample. Using the spectral subtraction technique and calibrations of the continuum-flux near the line of interest, the available information on the chromospheric activity flux is extracted. Most of the chromospheric indicators included in the spectral range of the spectrograph, ranging from visible (VIS) - including the Na I (D₁,D₂) He I D₃, and H α lines - to near-infrared (NIR) - that include the Ca II IRT, He I λ 10830 Å, Paschen α and Paschen β lines - are used. For the implementation of the spectral subtraction technique, a PYTHON code ISTARMOD based on a previous FORTRAN one, formerly used by the research group, is used. The synthetic spectra for effective temperatures in the range [2400, 7000] K, allow through the calibrations a comparison of the flux-flux relationships with previous works performed for F, G and K dwarfs. The studies of flux-flux relationships of lines formed at different chromosphere layers seek for a better understanding of the magnetic activity of M-type dwarf stars and try to determine the number of different chromospheric emitters populations, deduced from the non-universality of these relationships for Ca II IRT lines.

My poster is available at <https://doi.org/10.5281/zenodo.7668217>