Preparation of the CARMENES Input Catalogue

Low- and high-resolution spectroscopy of M dwarfs

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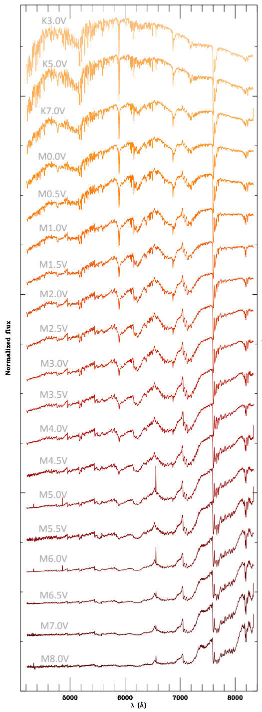
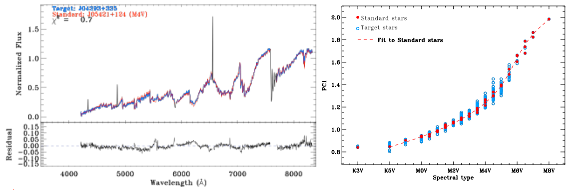
The identification of the most promising targets is a crucial first step to ensure an efficient use of the CARMENES guaranteed time. To achieve this, we obtained low-resolution (R ~ 1500) spectra of 752 M (and late K) dwarfs fainter than J = 9 mag with CAFOS at the 2.2 m Calar Alto telescope. For all of them, we have derived spectral types with 0.5 subtypes accuracy. We have also studied metallicity and surface gravity from spectral indices, and activity from pEW(Hα). Next, we have observed 522 M dwarfs at high-resolution (R = 30,000–48,000) with FEROS at ESO/MPG 2.2m La Silla, CAFE at 2.2m Calar Alto and HRS at Hobby Eberly Telescope. We determine for the first time projected rotational velocity *vsini* (±0.2–0.5 km/s) and radial velocity (±0.1–0.2 km/s) of 414 stars. Our observations allow us to identify high-activity, low-metallicity and low-gravity stars, single- and double-lined spectroscopic binaries and, especially, fast rotators, which should be discarded from any target list for exoplanet searches. Here we present preliminary results.

Low-resolution spectroscopy (Alonso-Floriano et al., in prep.)

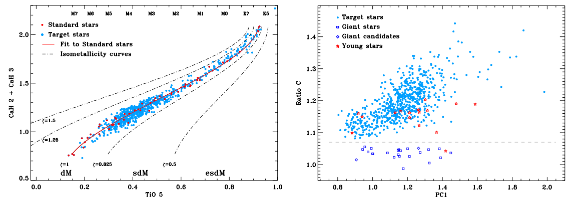




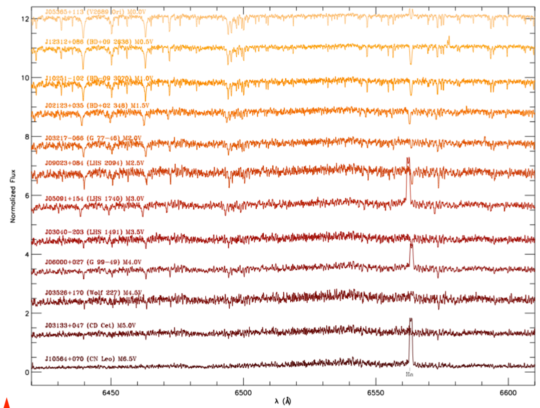
Top plots, **best fit and PC1 index relation for spectral typing**: We use two different approaches for spectral typing. First, we compare the full spectral range of our targets and of our standard library and look for the best match through a least-square minimisation. Second, we fit the best six indices for spectral typing to our standard stars. Finally we give a weighted-average spectral type per target with an accuracy of 0.5 suybtypes.

Left plot, **CAFOS spectra of the prototype standard stars**: We build our own library of standard stars. It consists of one to four standards per subtype covering a range from K3.0–M8.0V.

Bottom plots, **metallicity-sensitive CaH indices vs. temperature-sensitive TiO5 index** and **gravity-sensitive Ratio C index vs. temperature-sensitive PC1 index**: We follow the procedure showed in Lépine et al. (2007) for finding low-metallicity candidates. We looked for low-gravity candidates by the analysis of the Ratio C (Na I doublet around 820 nm).

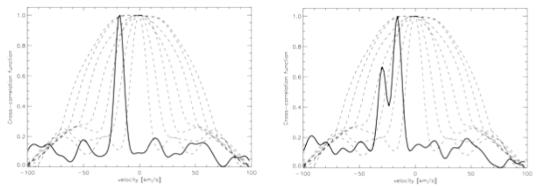


High-resolution spectroscopy



Top plot, **19-nm wide segments of FEROS spectra** around the Hα region of 12 standard stars covering the whole M0.0-6.5V spectral-type interval. Note the radial-velocity shift and the chromospheric Hα emission.

Bottom plots, **cross-correlation functions** of a single, slowly-rotating star (left) and a new spectroscopic binary (right) used for *vsini* determination.



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