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Earth-like planets around M-type stars

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Abstract

Exoplanet research has made a great progress over the past decade. Since the first exoplanet discovered around a star in 1995 (Mayor & Queloz, 1995), more than 450 exoplanets have been identified and most of them with high-precision radial velocity measurements. The new challenge in this field is to detect Earth-like planets in the habitable zone of their host stars. Nowadays, the discovery of this kind of planets around solar type stars is out of the reach of the most precise spectrographs, but work is under progress to push the limits of optical spectroscopy towards the detection of small planets. On the other hand, late-type stars provide a good opportunity to detect small planets. A radial velocity accuracy of 3 $\mathrm{m\,s^{-1}}$ will permit the detection of super-Earths inside the habitable zone of stars later than M3 at a 2 σ significance. However, the spectroscopic discovery of planets around these stars is difficult due to their intrinsic faintness and the intrinsic stellar jitter. A viable alternative is to focus on the near IR spectral band, where these stars are brighter and the jitter is significantly smaller. We are developing a program to characterize the radial velocity jitter and the photometric variability of late-type stars, and this should produce a selection of the best candidates to be surveyed. In this contribution we present the first results of this program.