

Near-infrared spectroscopic follow-up of Gaia ultra-cool dwarfs candidates

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Abstract. Ultra-cool dwarfs (UCDs) are red, cool objects at the end of the main sequence, with spectral types later than M7. They encompass the stellar-substellar boundary, and their faintness make them an elusive population. In the solar neighbourhood, their census is incomplete, despite representing an important fraction of local objects in the Milky Way. Numerous new UCDs candidates have been identified thanks to the Gaia survey, and have to be spectroscopically confirmed to complete a census.

We analyse the near-infrared (NIR) spectra, obtained with the SOFI spectrograph between 0.93 and 2.5 microns ($R \sim 600$), of 61 UCDs candidates, closer than 50 pc from the Sun or from common proper motions systems. We confirm that 56 are ultra-cool dwarfs, from their NIR spectral-type. Their NIR spectral type is close to what was expected from their photometric spectral types, derived using their absolute magnitude, while colour—spectral types relations give results with lesser agreement. We find that UCDs identified in previous surveys have similar published spectral types.

In our UCD sample, we detected unresolved binary candidates, from features in their spectra, revealing the presence of a cool companion. Additionally, we review 5 systems with common proper motions containing at least one UCD from our sample, and objects with peculiarities in their spectra.