The Gaia ultracool dwarf sample ? II. Structure at the end of the main sequence

Smart R.L.

Marocco F.

Sarro L.M.

Barrado D.

Beamín J.C.

Caballero J.A.

Jones H.R.A.

We identify and investigate known late M, L, and T dwarfs in the Gaia second data release. This sample is being used as a training set in the Gaia data processing chain of the ultracool dwarfs work package. We find 695 objects in the optical spectral range M8?T6 with accurate Gaia coordinates, proper motions, and parallaxes which we combine with published spectral types and photometry from large area optical and infrared sky surveys. We find that 100 objects are in 47 multiple systems, of which 27 systems are published and 20 are new. These will be useful benchmark systems and we discuss the requirements to produce a complete catalogue of multiple systems with an ultracool dwarf component. We examine the magnitudes in the Gaia passbands and find that the GBP magnitudes are unreliable and should not be used for these objects. We examine progressively redder colour?magnitude diagrams and see a notable increase in the main-sequence scatter and a bivariate main sequence for old and young objects. We provide an absolute magnitude ? spectral subtype calibration for G and GRP passbands along with linear fits over the range M8?L8 for other passbands.

Binaries: visual

Brown dwarfs

Hertzsprung?Russell and colour?magnitude diagrams

Solar neighbourhood

Stars: late-type