The study of ASCC20 is part of a big project where the main goal is to produce a reliable census and to derive different remarks for a sample of 11 open clusters.

1. Objectives

- To derive a census of low mass stars using multi-wavelength photometry and spectroscopy, from our own observing runs and from different public databases, going deeper than the Gaia final results.
- To derive IMFs down to the sub-stellar domain.
- To locate the Lithium Depletion Boundary to derive an alternative age based on this method and to compare with previous values.

2. Selection of candidates

- ASCC-20 is an open cluster with an estimated age of 22 Myr (based on the upper main sequence fitting) and located at 450 pc with $A_V = 0.129$ mag (Kharchenko et al. 2005a), Francis & Anderson (2012), using Hipparcos data, have derived a distance of ~320 pc.
- We have created a multi-wavelength photometric database of sources around the cluster by using archival data. The complete set of photometry contains the bands: B1Vr (Tycho-2), griz, JHKs (2MASS), and W1W2W3W4 (WISE).
- In order to select a bona fide census, a selection based on several Colour Magnitude Diagrams (CMDs), Colour-Colour Diagrams (CCDs) and theoretical stellar evolutionary models from Allard et al. (2012) has been made (Fig. 1).

3. Spectroscopic follow-up of candidates

- Several spectroscopic campaigns have been carried out using CAHA-TWIN and GTC-OSIRIS in order to confirm their membership.
- Spectral types have been derived by visual inspection and also using a least squares minimization, by comparing the spectra with several libraries of templates (Fig. 2).

4. Spectroscopic analysis of the members

- Equivalent widths of some spectral features, Hα and alkali elements (Li, Na and K) are measured (Fig. 2).
- Metallcities and luminosities of the M spectral type sample are studied measuring spectral indices related with the CaH and TiO molecular bands, Fig. 3. (see Reid et al. 1995 and Lépine et al. 2007c).
- Some sources show other emission lines, i.e. He (5875Å triplet and [O I] 6300Å. These fulfill the empirical T Tauri criteria from Barrado y Navascués & Martin (2003), Fig. 4.

5. Conclusions

- This is the most complete study of ASCC20 up to date. We have confirmed the membership of several candidates down to the M7 spectral type.
- The spectral analysis reveals the youth of the cluster.
- Gaia will provide exact distance and proper motion for the cluster. However our census is deeper and complement those data.