Abstract

In recent years, a series of young stellar kinematic groups of late-type stars with similar space motion and ages ranging from 8 to 50 Myr (see Zuckerman & Song 2004 and references therein) has been discovered in our neighborhood: the TW Hya, Pi AB Dor, eta Cha, e Cha, Tucana, and Horologium associations. In Galactic velocity space, they are situated inside the boundaries of the Local Association (see Fig. 1), a mixture of young stellar complexes—OB and T-associations—and clusters with different ages (Eggen 1975, 1983a, 1983b; Montes et al. 2001).

Very recently, Zuckerman et al. (2004) have identified a large group of stars with the same space motion as the well-known young K-dwarf AB Dor (15 pc), a quadruple system (Close et al. 2005; Guaitado et al. 2006) made up of three late-type stars—AB Dor A (HID 36705), AB Dor B, and AB Dor C—and a very low mass companion that has recently been object of discussion because of the discrepancy between its dynamical mass and that predicted by evolutionary models (Close et al. 2005). All the stars listed in Table 1 of Zuckerman et al. (2004) are situated inside the Local Association (see Fig. 1) near the boundaries of the young disk stellar population (Eggen 1984), and each has at least one indicator of youth. Taking the intensity of the Hα emission line of these stars and the position in a V-Ks diagram of three M-type members of the MG into account, they estimate an age of 50–100 Myr for the AB Dor MG.

Very recently, Luhman et al. (2005) and Luhman & Potter (2006) have shown that the components of AB Dor should have an age of 75–100 Myr. Very recently, IC 2391 clusters and the EW(Li i) of AB Dor A with that of rapidly rotating K dwarfs in the Pleiades. Moreover, with an age of 100 Myr the discrepancy between observations and models for the very low mass companion (AB Dor C) would disappear (e.g., Close et al. 2005). Taking this into account, they propose an age range of 75–150 Myr for all the MGs.

We have added 13 stars to the initial sample of Zuckerman et al. (2004), (see Lopez-Santiago et al. 2006) from our catalog of late-type members of young stellar kinematic groups (Montes et al. 2005). From our detailed analysis of this moving group (Lopez-Santiago et al. 2006) we have concluded that the members of AB Dor MG are situated at a mean distance of 30 pc and show luminous abundances typical of stars with 30–50 Myr (Fig. 3), which is in agreement with their position in the MV versus V – Ks diagram (Fig. 4). Finally, a set of stars with EW(Li i) and positions in the CMD compatible with an age of 80–120 Myr are mixed with Hercules-Lyra and AB Dor MG, and have been classified as other members of the Local Association subgroup B4 (subgroup).

Here we present the results from new high resolution spectroscopic observations (see Figs. 5, 6, 7) of possible members of the AB Doradus moving group.

We have used high resolution echelle spectroscopic observations taken with the FEROS spectrograph at the 2.2 m telescope from ESO. We have determined precise radial and rotational velocities, the Li I 6707.8 Å line equivalent width (EW), and the Li I 6708 Å line region. Note the intense Hα emission reversal in the more active stars.