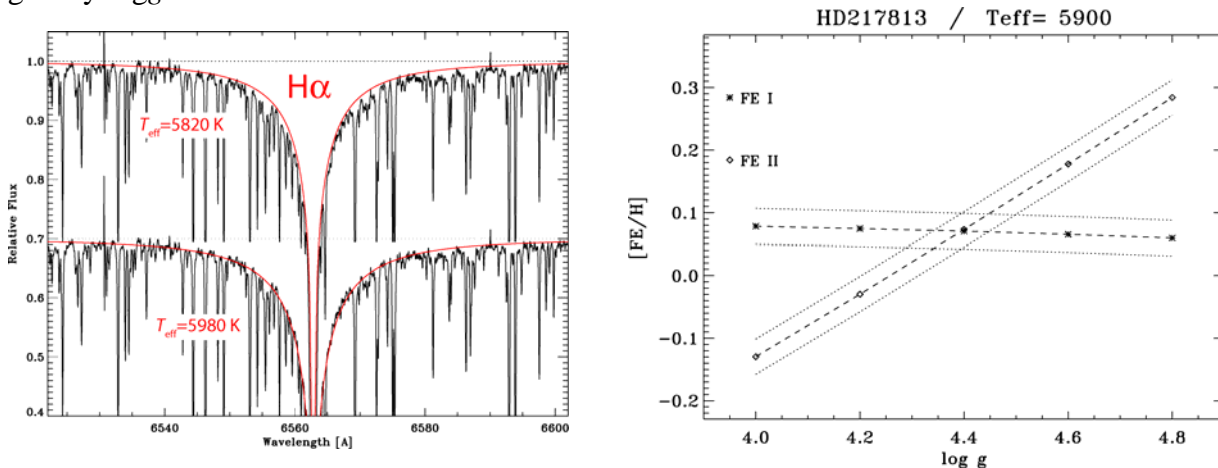


We determine the properties of the UMa association and work on a clean member list. For that reason we have taken high-resolution spectra with high signal-to-noise ratio of a large sample of members and possible members in order to do stellar atmosphere analysis. We have shown that precise stellar atmosphere analysis is possible with the Coudé-Échelle spectrograph at the Thüringer Landessternwarte in Tautenburg.

The UMa open cluster and a large number of additional stars form the UMa association. This structure has an intermediate age between the Hyades and the Pleiades open clusters but is much closer so that we can study its evolutionary stage very well. However recent membership assignments (Montes et al., 2001; King et al., 2003) are in conflict for several stars. Additionally age determinations range widely from 100 Myrs (König et al., 2002) to 500 Myrs (King et al., 2003).

Spectra with high spectral resolution and high signal-to-noise ratio of a large sample of members and candidates of the UMa association will enable us to address those problems homogeneously and in detail. One major part of this work is the stellar atmosphere analysis of the late-F to early-K type stars following the method of Fuhrmann (2004). So far such an analysis has not been done homogeneously for a larger sample of the UMa association. We have observed most stars of our northern sample with the fibre-coupled Échelle spectrograph FOCES on Calar Alto (Spain) – like Fuhrmann (2004). The Coudé-Échelle spectrograph at the Thüringer Landessternwarte in Tautenburg (TLS) also allows stellar atmosphere analysis at a high level of precision as is illustrated in the following example with HD 217813, a member of the UMa association. The spectrum was obtained at TLS in July 2003. High signal-to-noise ratio and high spectral resolution allow the precise determination of e.g. effective temperature T_{eff} and surface gravity $\log g$.



Left: Fitting synthetic spectra (red) to observed Balmer lines (black) – here $H\alpha$ – allows to constrain T_{eff} to $5900 \pm 80 \text{ K}$. **Right:** The surface gravity is determined by the iron ionisation equilibrium, i.e. FeI and FeII lines are required to yield the same Fe abundance. This results in: $\log g = 4.40^{+0.18}_{-0.10}$

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