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WHAT I AM WORKING ON

- Search for M and L-dwarfs in the solar neighbourhood

  $\Rightarrow$ FORS and ISAAC on VLT

- Search for PMS brown dwarfs in α Persei cluster

  $\Rightarrow$ Ω -Prime in Calar Alto

$\rightarrow$ **Is the IMF still rising in the BD regime ?**

$\rightarrow$ **Is the IMF universal ?**

PART 1

Survey for very red high proper motion stars

- Reduction of the FORS optical spectra of 23 candidates
- 6 candidates with both optical and infrared spectra
- Detection of early and late M dwarfs
- No early L dwarfs
- No lithium absorption
- Determination of the spectral type using optical and IR indices

PART 2

Alpha Persei cluster

- $\alpha = 3^h22^m$ and $\delta = 48°37'$
- Extinction negligible $A_V = 0.30$
- Parallax measured by Hipparcos $\Rightarrow d = 185 \pm 10\,pc$
- Age $\approx 90 \pm 10\,Myr$ by lithium method (*Stauffer et al.)*
- Low-mass stars candidates based on (I,R-I) diagram
- Observations at Calar Alto : 5 optical fields covered in K' band
- Colour-magnitude diagram (K',I-K')

Collaboration and Outlook

- Optical data for Alpha Persei

  $\Rightarrow$ *J. Bouvier in Grenoble*

- Spectral typing using IR spectroscopy

  $\Rightarrow$ *L.Testi in Arcetri*

- Evolutionary tracks of low-mass stars and brown dwarfs

  $\Rightarrow$ *F.Palla in Arcetri*

- Follow-up spectroscopy of α-Persei BD candidates
- Observations of other clusters

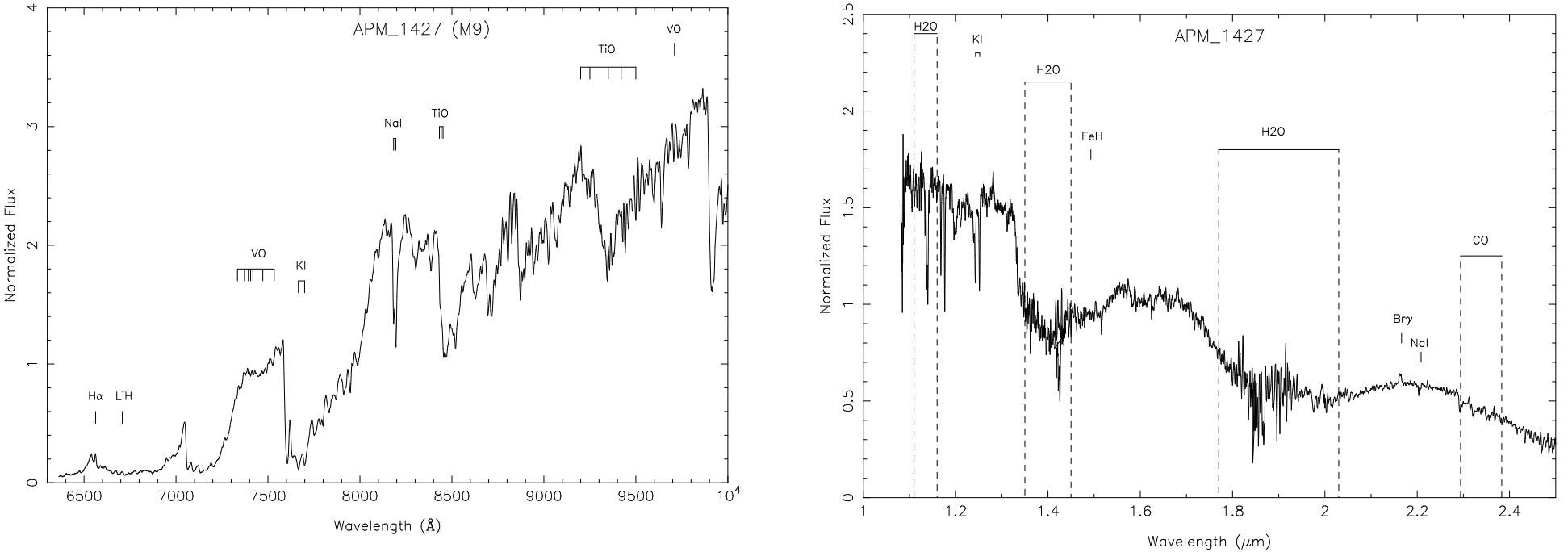

FIG. 1 – Optical (FORS) and infrared (ISAAC) spectra of APM1427

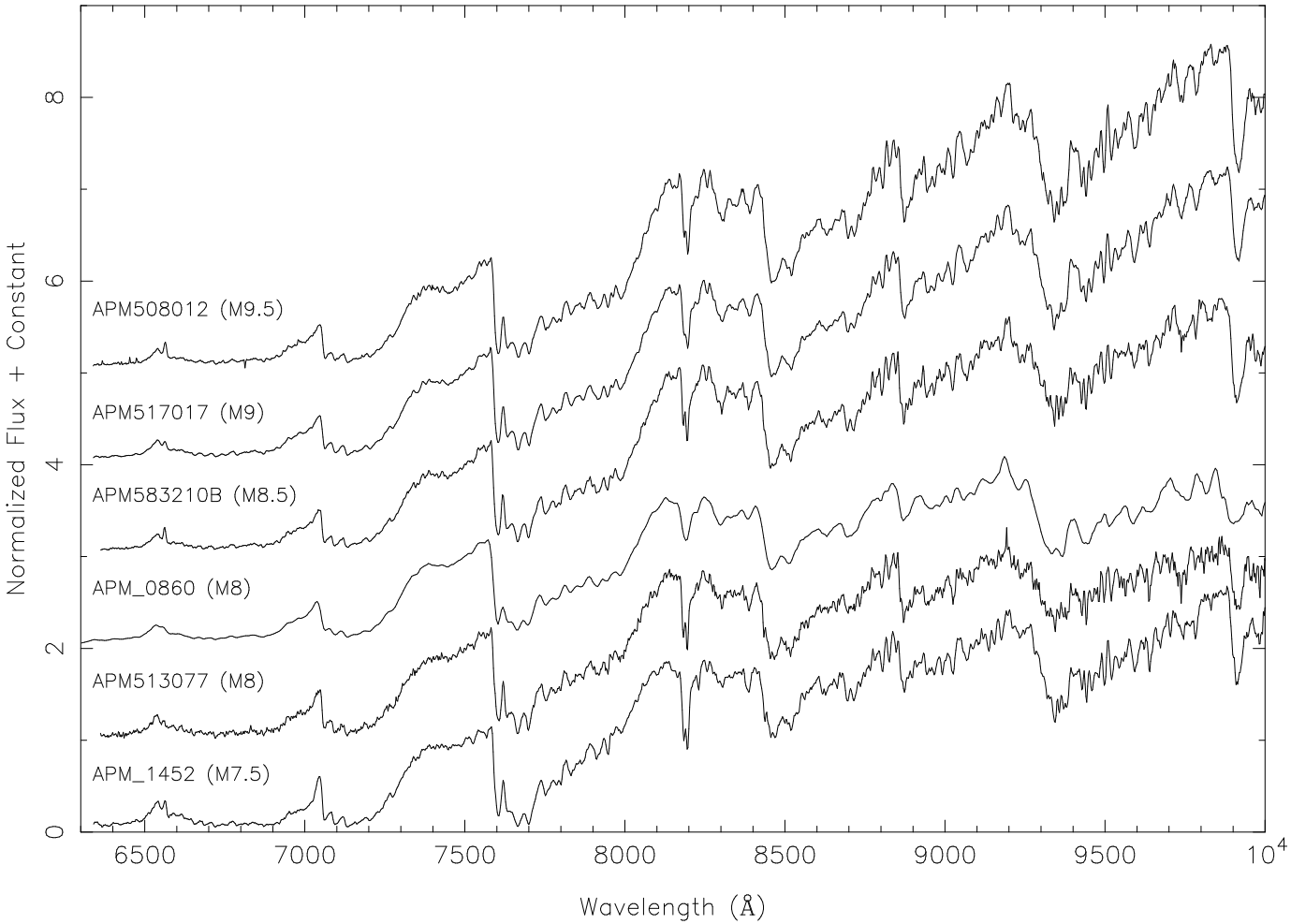

FIG. 2 – FORS optical spectra (R=680) of the 6 best candidates. Spectral types range from M7.5 to M9.

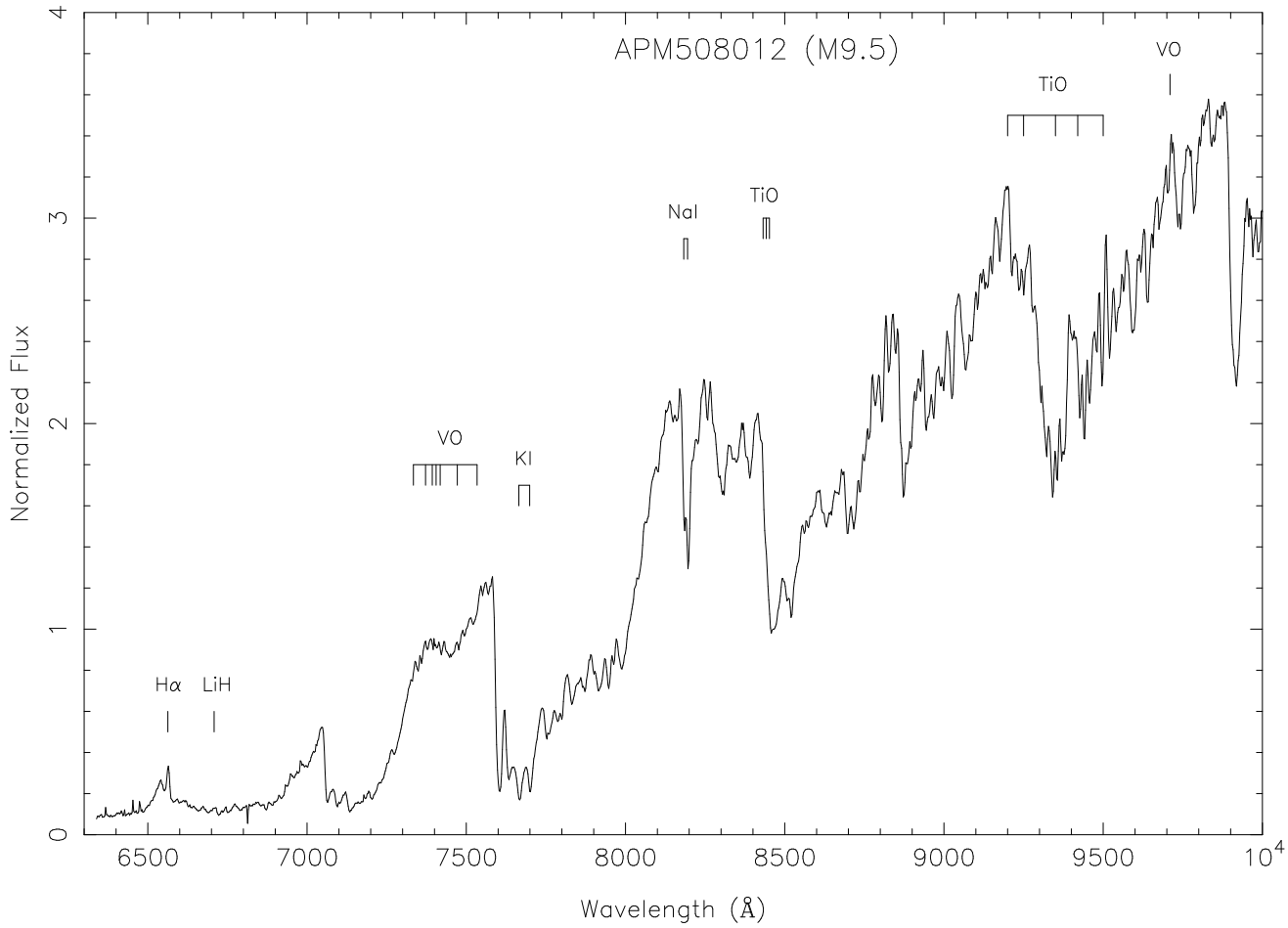

FIG. 3 – Example of an optical spectrum (R=680) with the position of some important lines

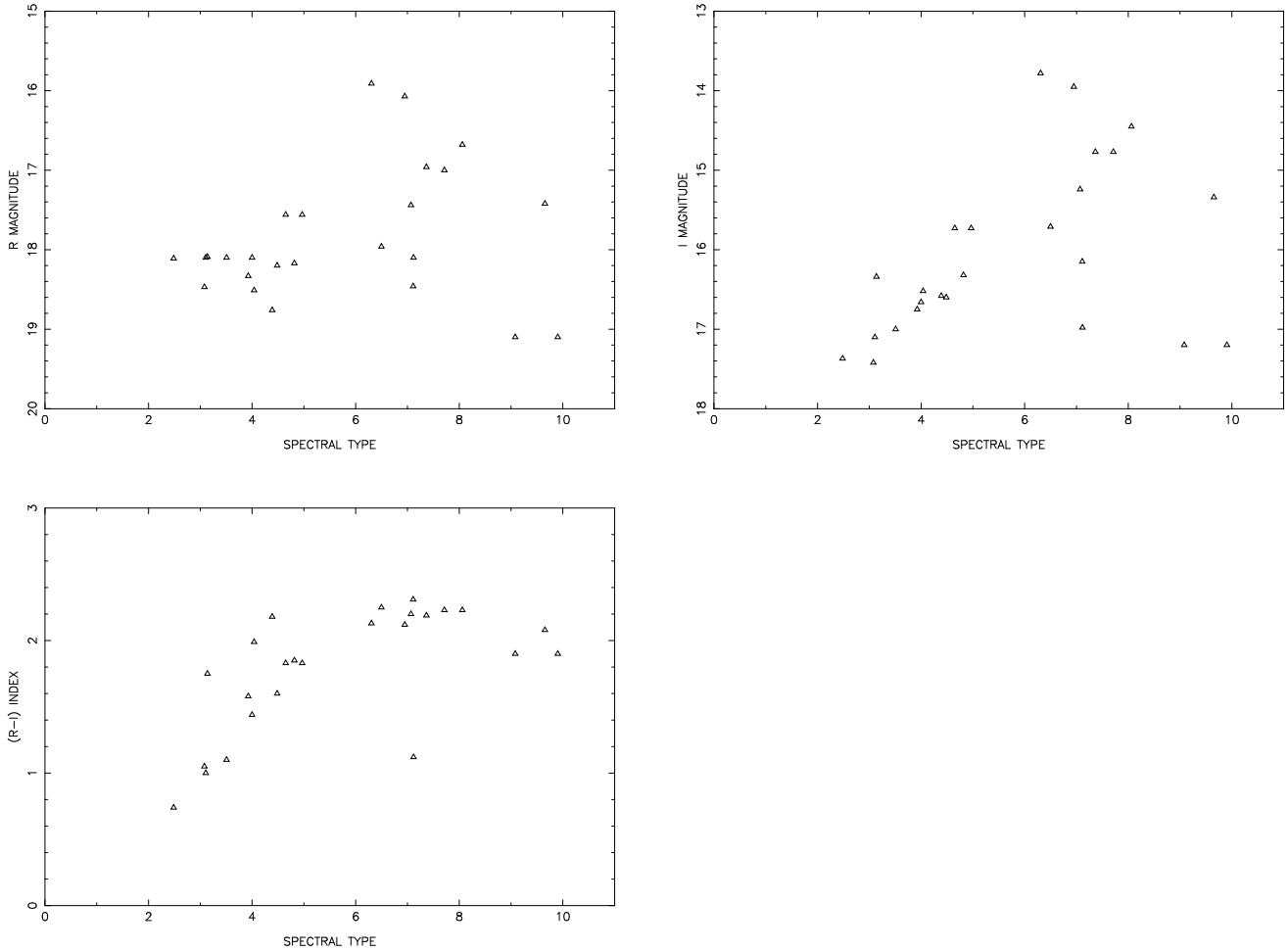

FIG. 4 – Relationship between the magnitudes of our objects and their spectral types

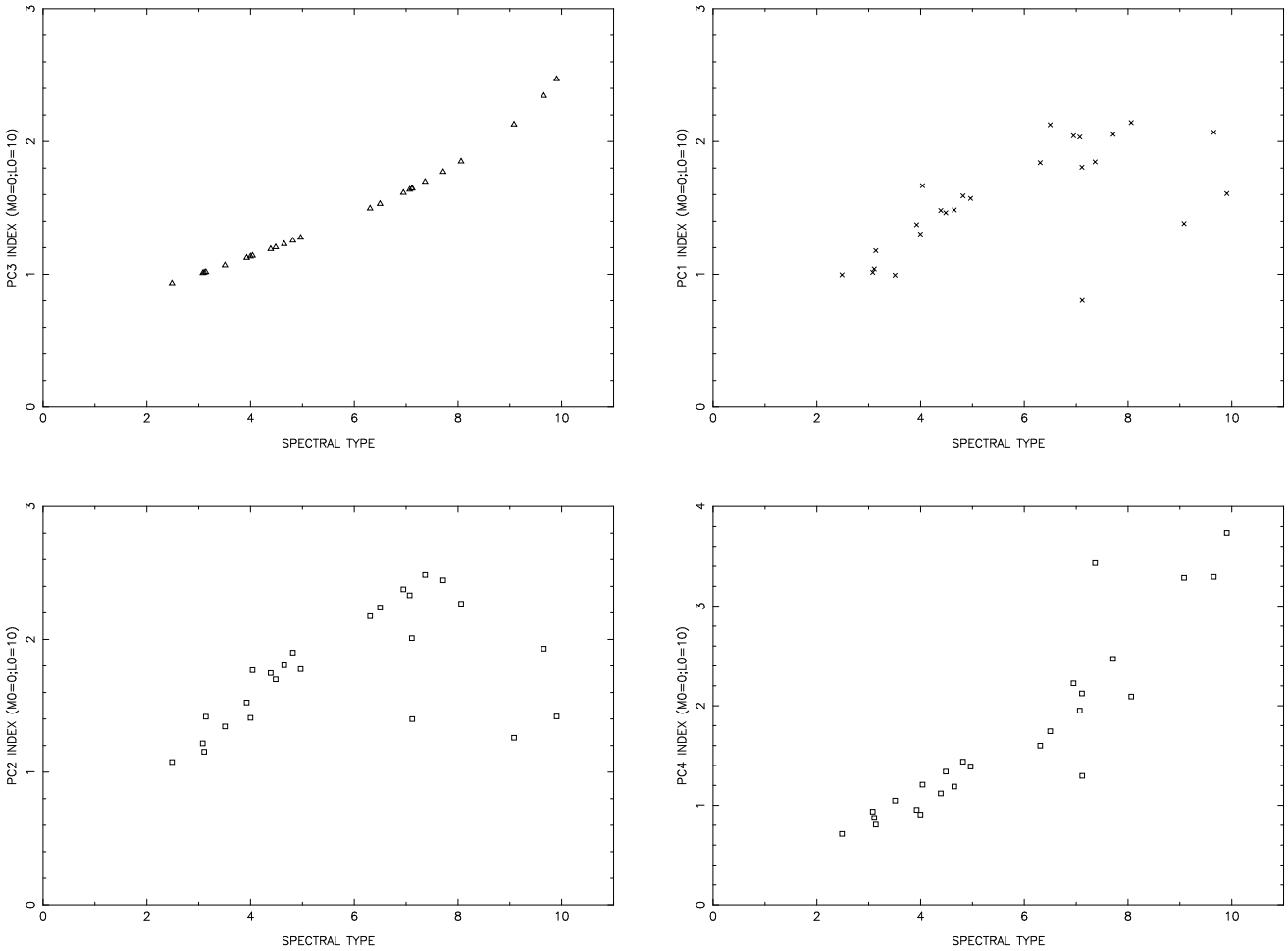

FIG. 5 – Indices from Martin et al. (1996) compared to the spectral types

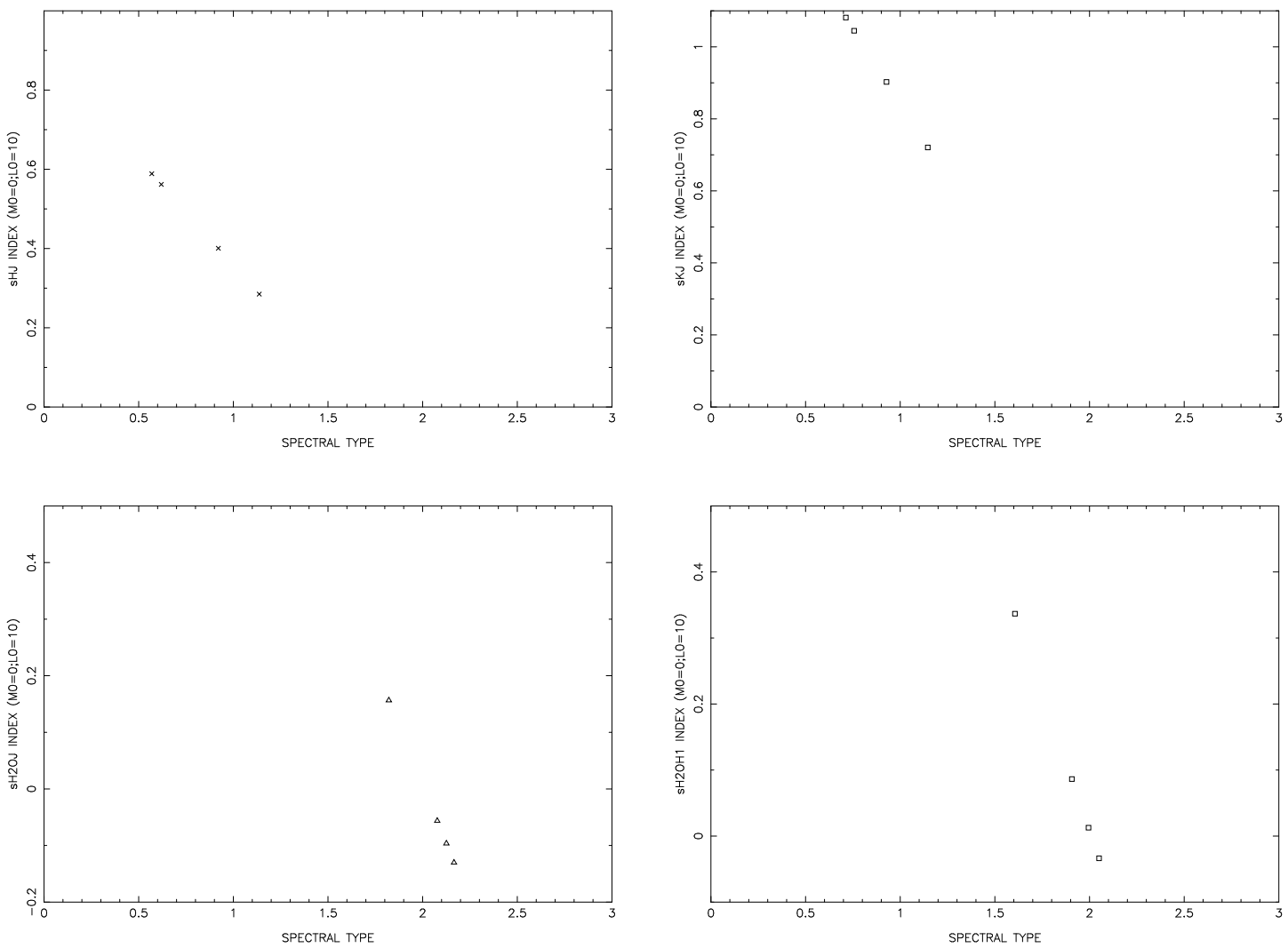

FIG. 6 – Infrared indices from Testi et al. (2001) and the derived spectral types

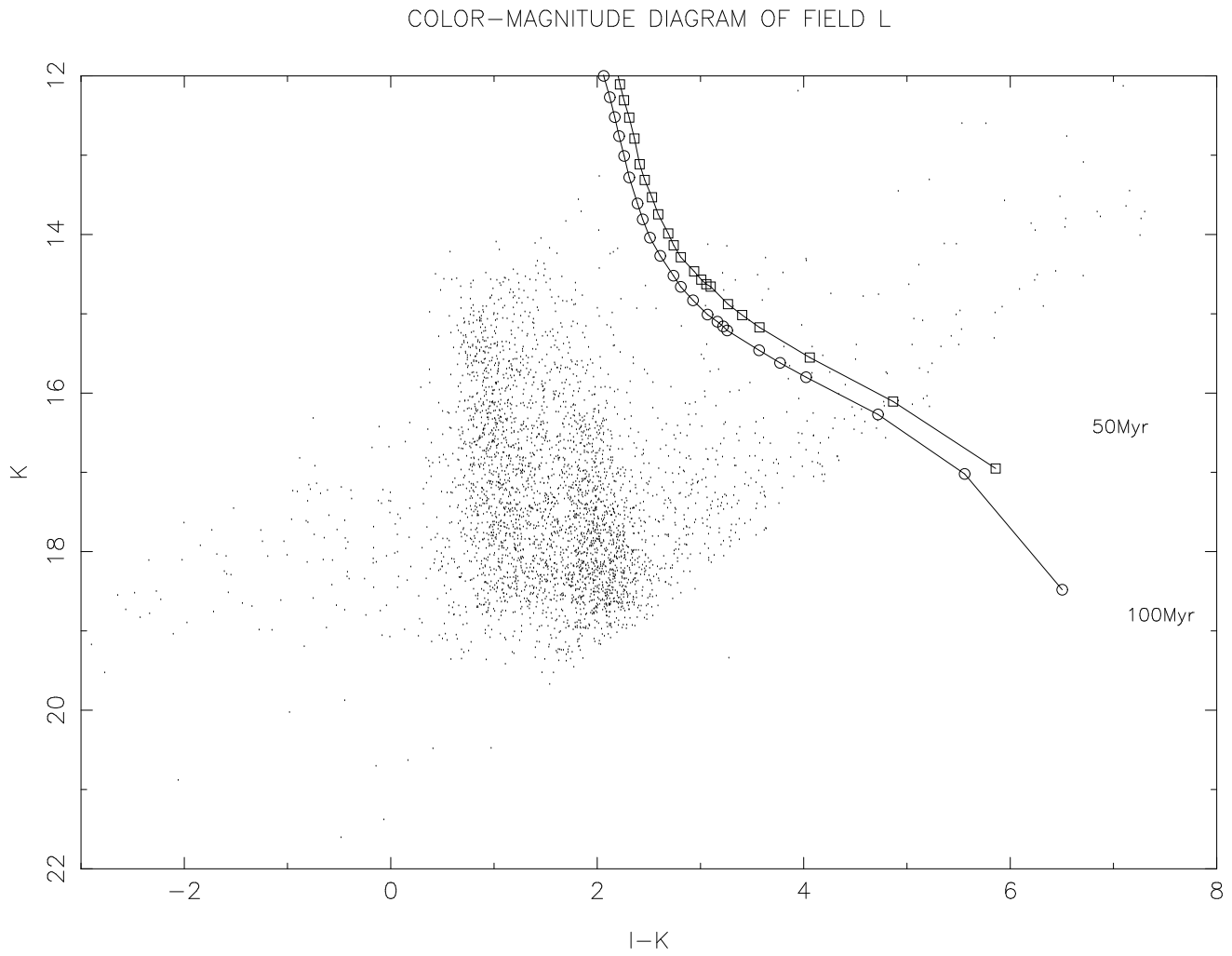

FIG. 7 – Colour-magnitude diagram (K',I-K') for two infrared Fields of View in α -Per. Evolutionary tracks from Baraffe et al. (1997) for 50 and 100 Myr and masses between 2.5 and 0.02 $M_{\odot}$ are also shown.

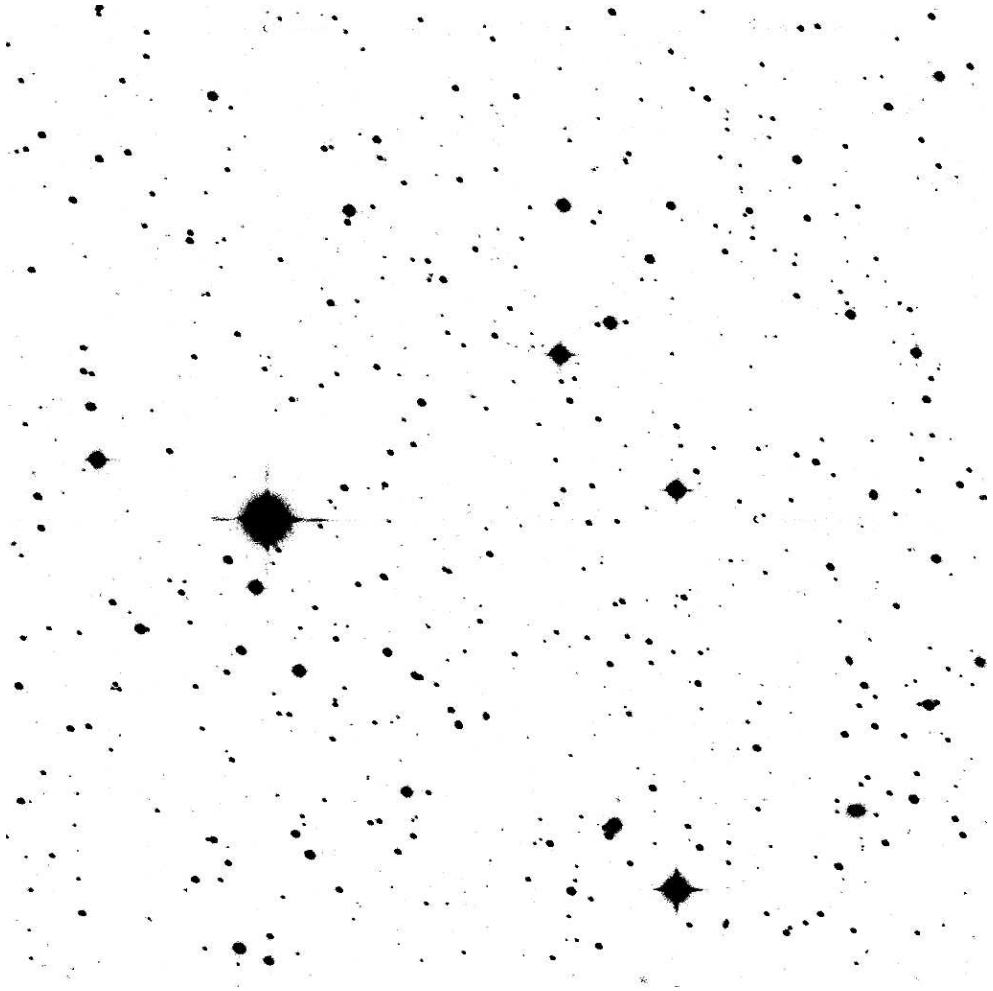

FIG. 8 – Image of one FOV (6,5' × 6,5') in K' band in α-Persei

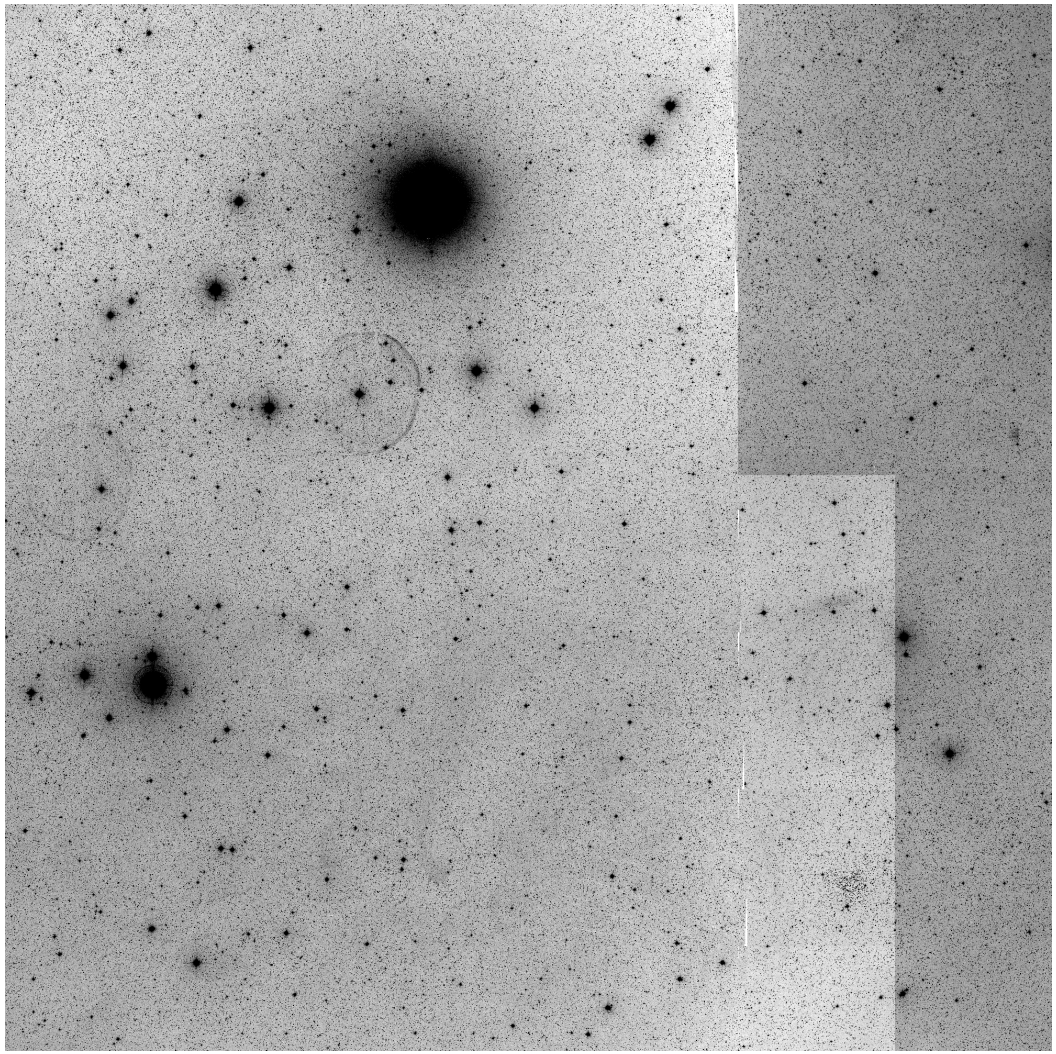

FIG. 9 – Image of α-Persei cluster : $4° \times 4°$