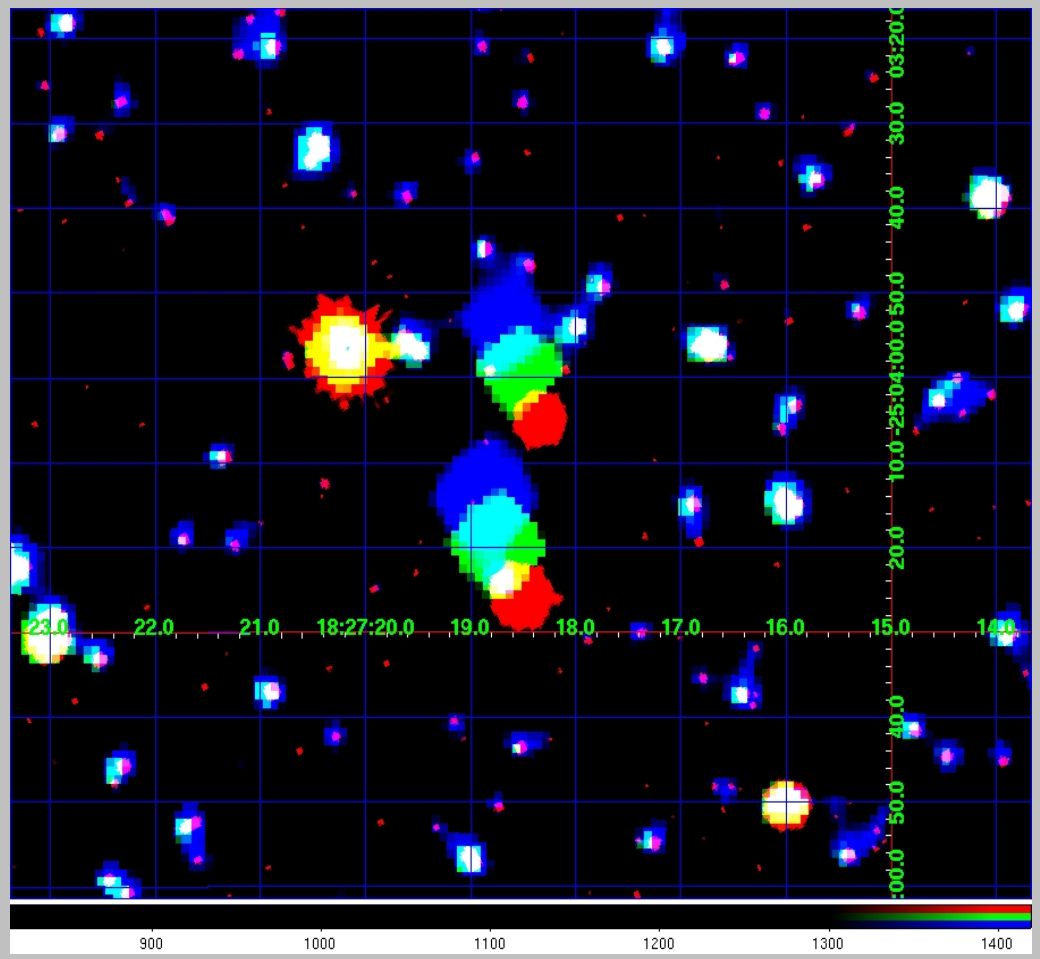
Search for Companions to High Proper Motion Stars with the VVV Survey. Discovery of Eight New Neighbours

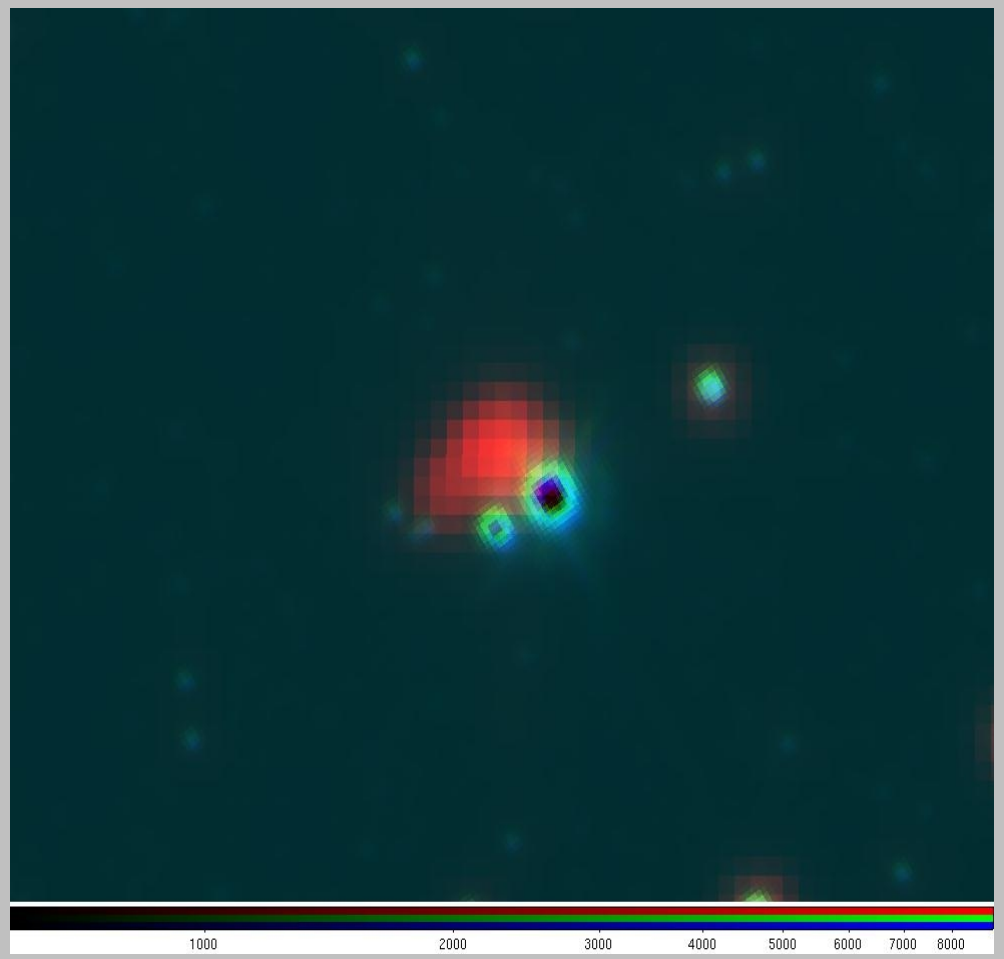
Valentin D. Ivanov (ESO),

Dante Minniti, Maren Hempel, Ignacio Toledo, Roberto K. Saito, Radostin Kurtev, Javier Alonso-Garcia, Juan Carlos Beamin, Jura Borissova, Marcio Catelan, Andre-Nicolas Chene, Jim Emerson, Oscar Gonzalez, Phillip W. Lucas, Eduardo Martin, Marina Rejkuba

Search for companions to high-PM nearby stars

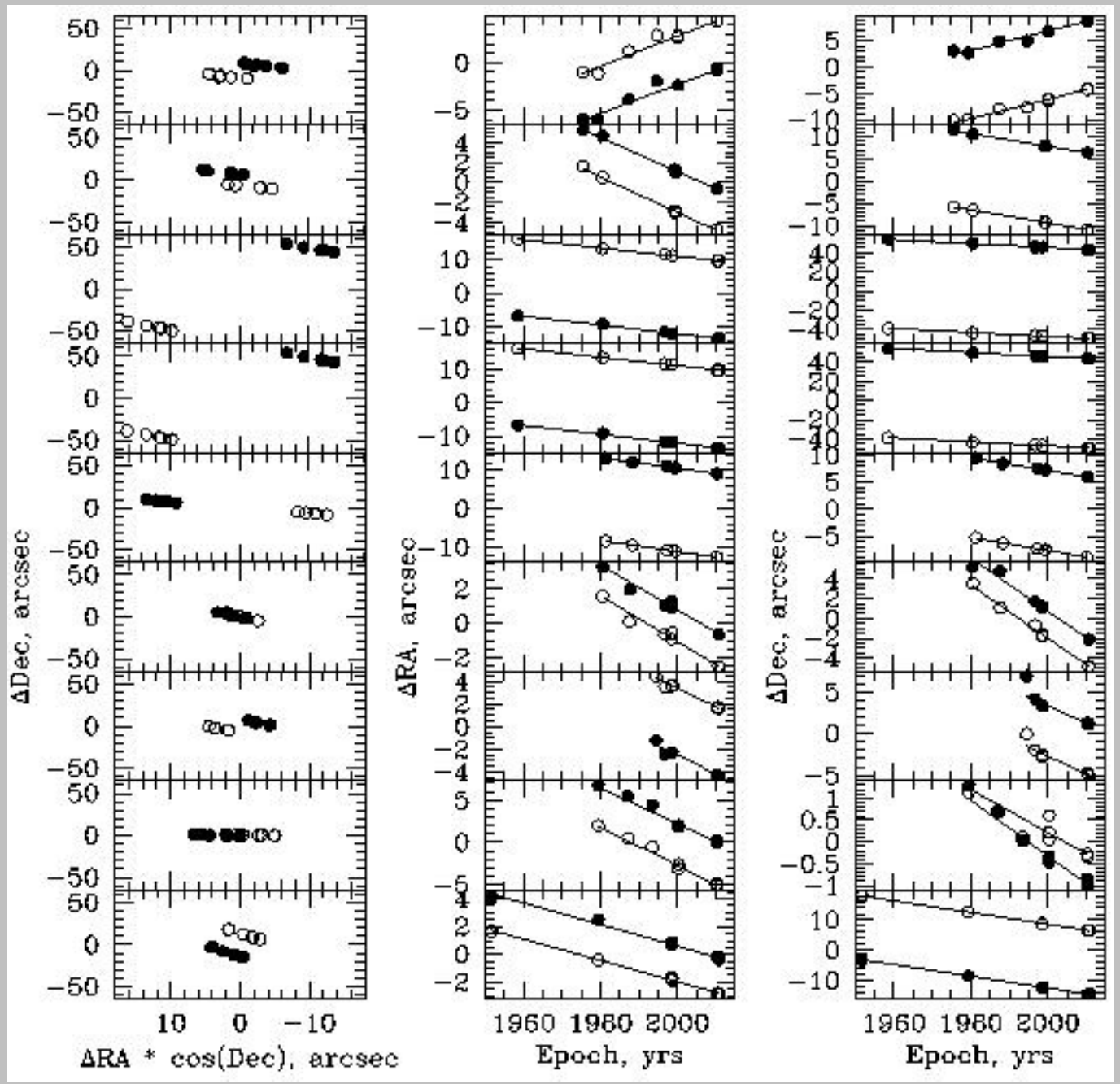
- quick search: create 3-colour images from VVV, 2MASS (and some other, usually an old optical survey)
- Sample: 168 stars (68 in the disk, 100 in the bulge) with PM>=200 mas/yr





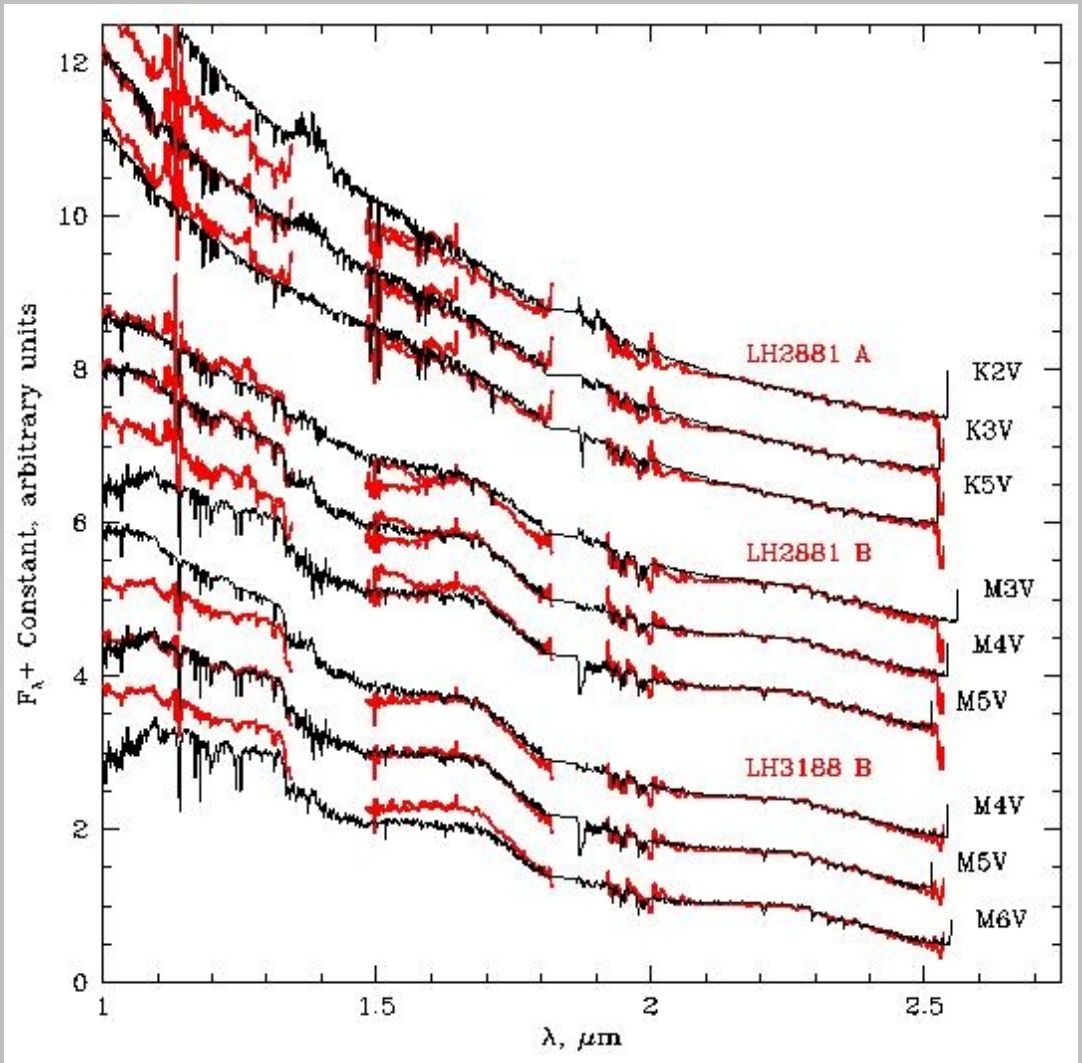
Search for companions to high-PM nearby stars

PM analysis:



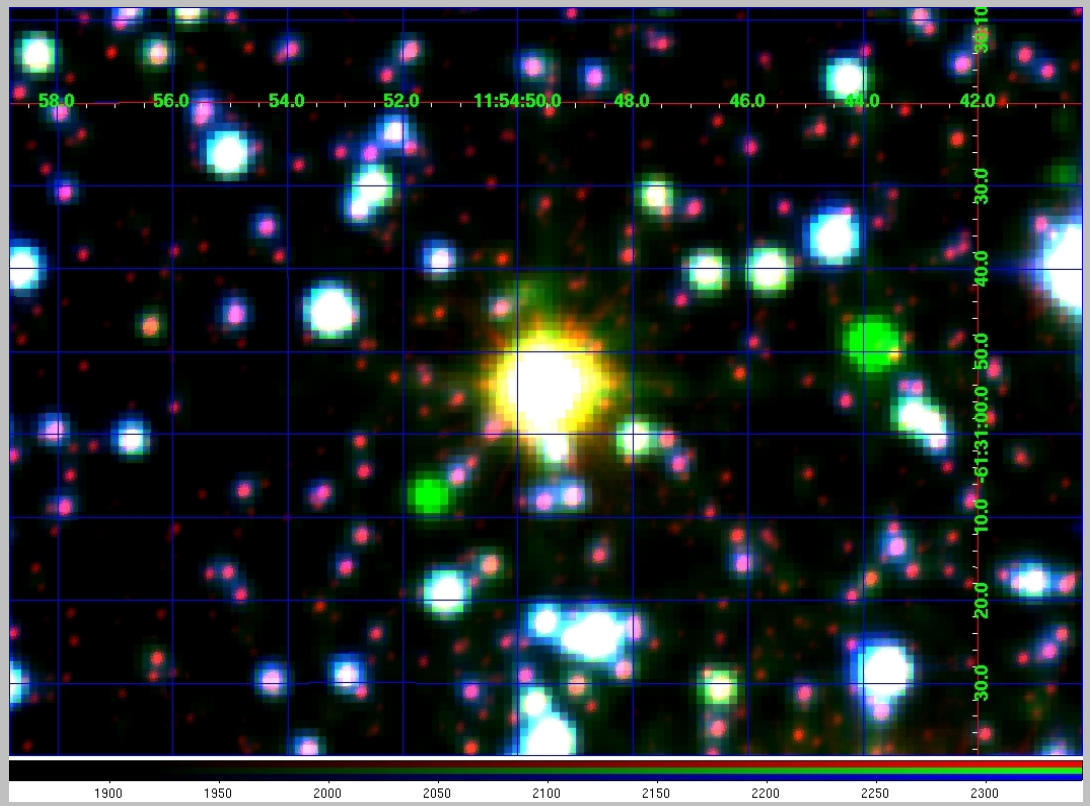
Search for companions to high-PM nearby stars

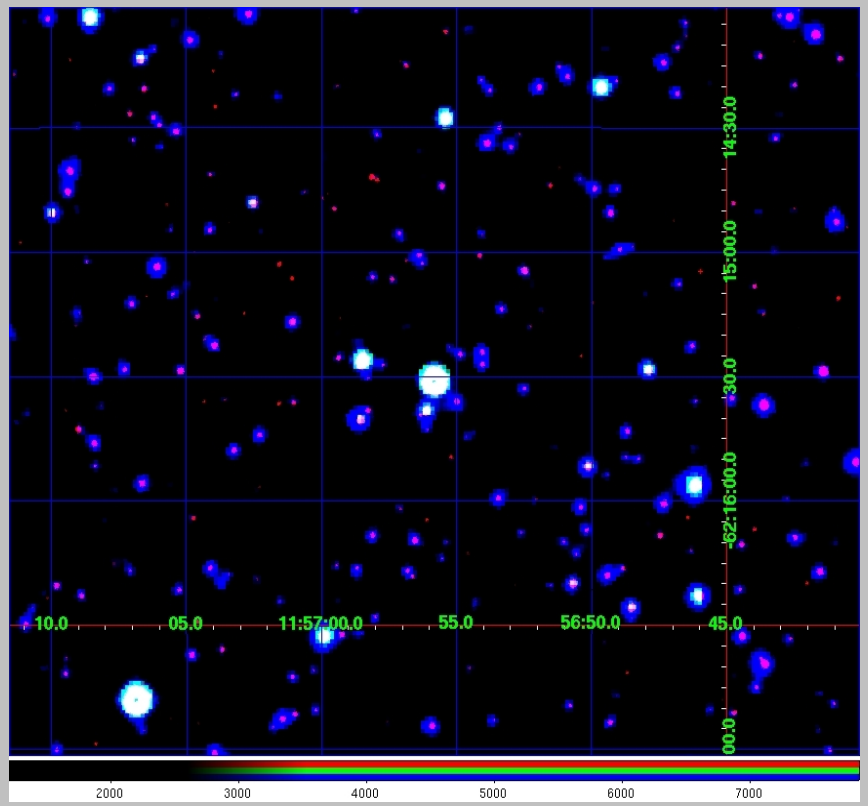
Spectroscopic follow up in progress... They are low-mass stars (spectral types mid- to late-M), no brown dwarfs.



Search for companions to high-PM nearby stars

Surprisingly, some known-to-be high-PM stars are not moving. About half of these are extremely red, indicating unaccounted colour related systematics in the previous studies. One pair that was though to be a binary was found not to be co-moving.





Search for companions to high-PM nearby stars

Summary:

- this project searches for companions to 168 known nearby, high proper motion stars comparing 2MASS and VVV images;

- 8 new co-moving companions around high-PM were found, as close as ~20 pc;

- 3 co-moving pairs were identified among the known high-PM stars;

- 1 unresolved case;

- 11 high-PM are not co-moving at all, and one pair that was though to be a binary was found not to be co-moving;

- a deeper, more complete high-PM star search will come from VVV alone closer to the completion of the survey when the VVV alone will supply at least 5 yr long time baseline.