

CREATION OF LARGE CATALOGUES BY USING OF VIRTUAL OBSERVATORIES.

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Goal: Creation a catalog of coordinates and proper motions for chosen fields

Steps:

- Develop an application program to search images in VO databases and download them to local computer
- Processing the downloaded images
- Analysis of the obtained results
- Creation and analysis of the catalogs of position for different epoch
- Creation a new catalog of coordinates and proper motions

Application program (AP)



- Develop AP
- Search of images in VO
- Download them to PC

AP has the ability to process XML files in VO Table format to generate links to images. Program runs under the Windows in multi-threaded mode.

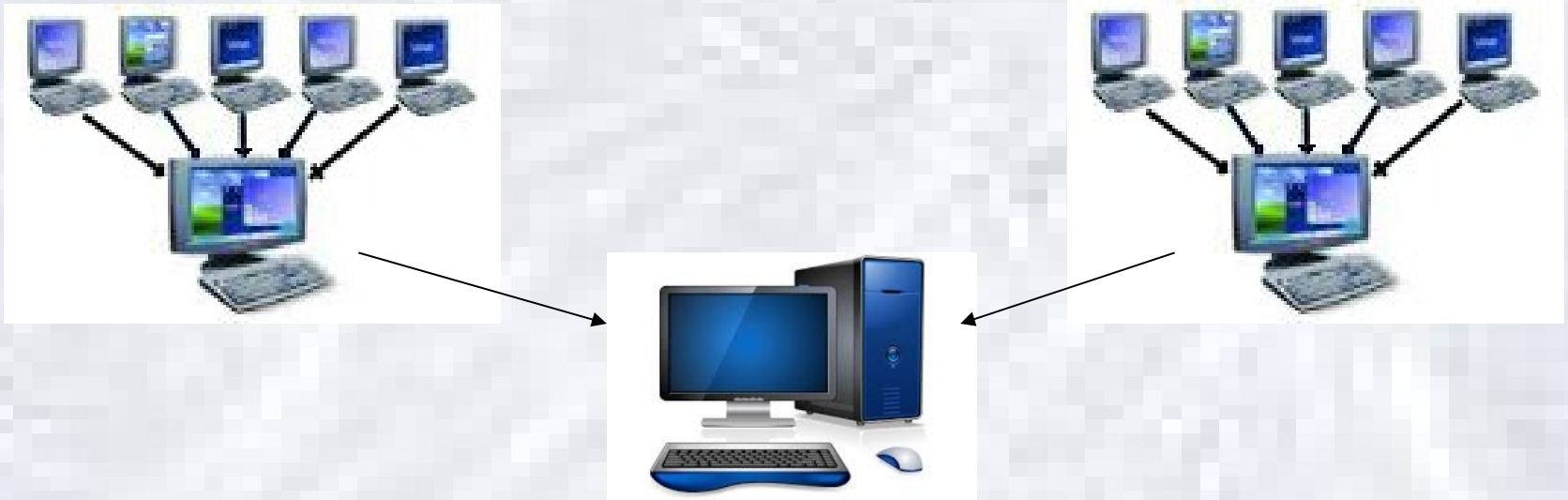
In 2014 we found and downloaded more than 145 thousand of images from 2MASS, DENIS and DSS sources in 500 fields.

300GB data in FITS files.

Total download time was about 7 days.

Plan for 2015 – 0.5-1.0 million images.

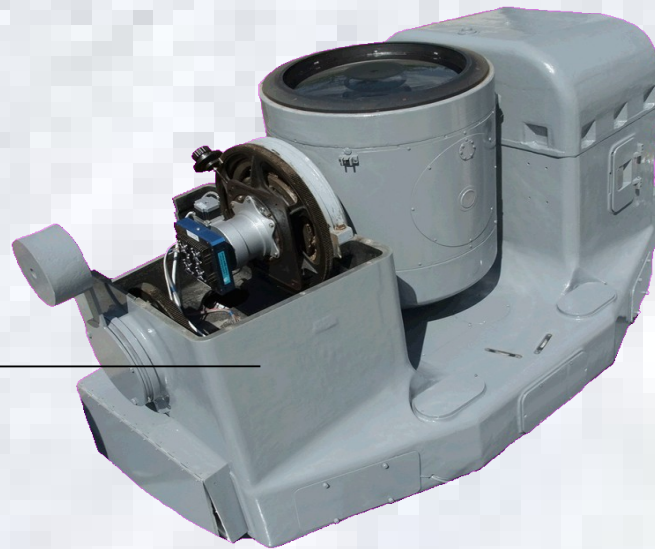
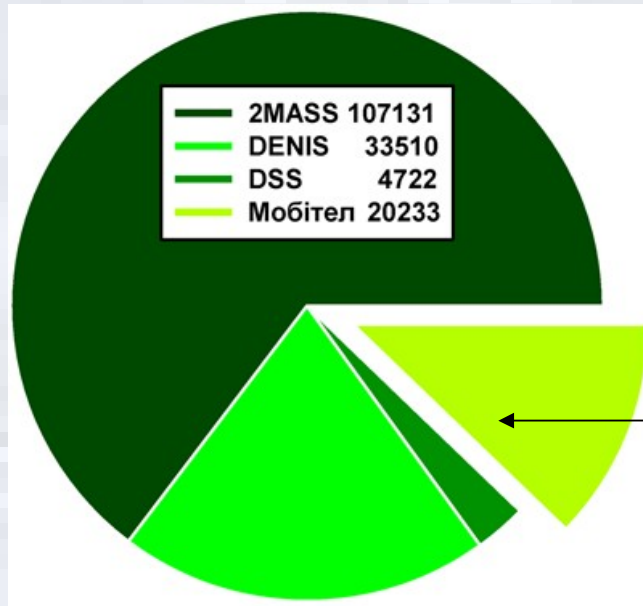
Processing of the downloaded images



To process the downloaded images, we created and configured a complex of 10 virtual machines on two PCs for parallel image processing by using Astrometrica program with UCAC4 catalog as reference one and special program for automation .

Total processing time was about 14 days.

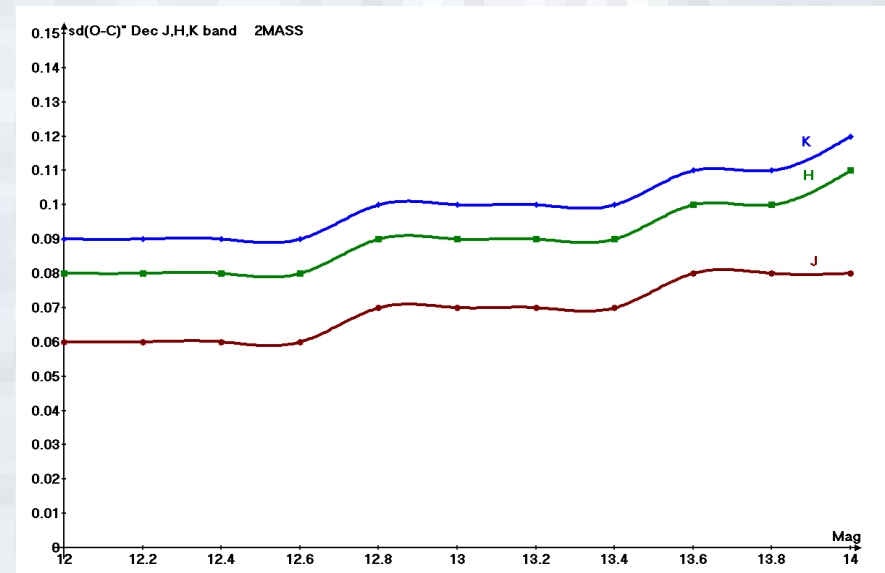
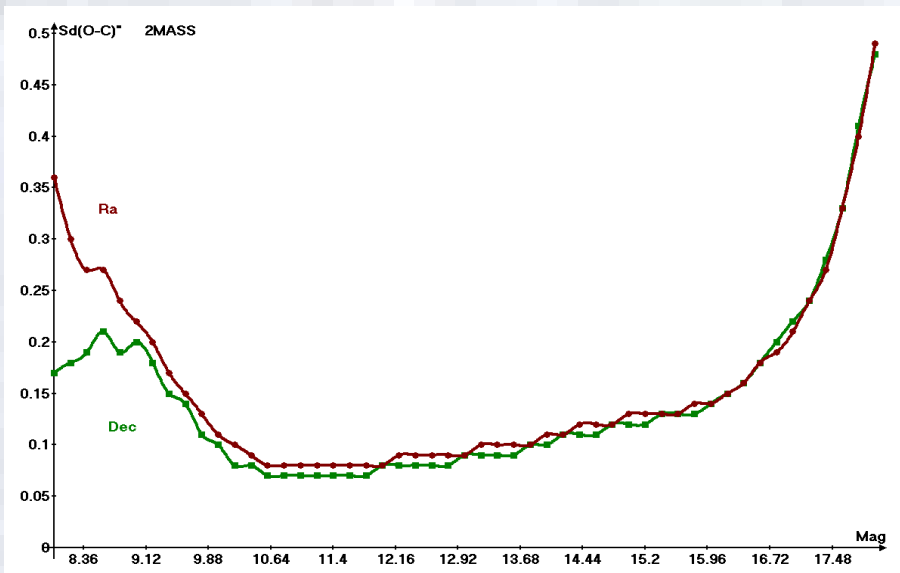
Processing of the downloaded images



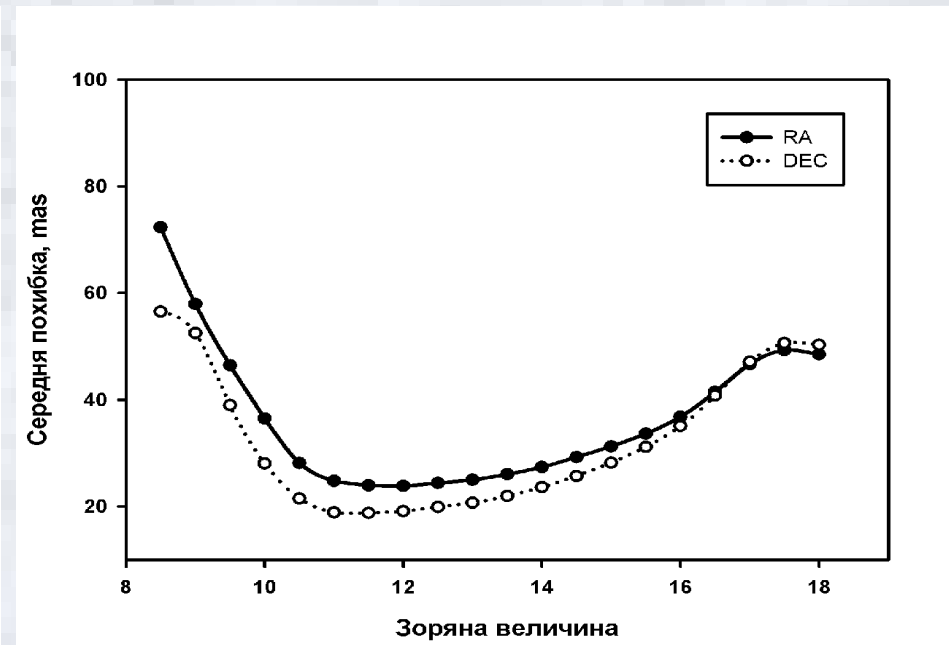
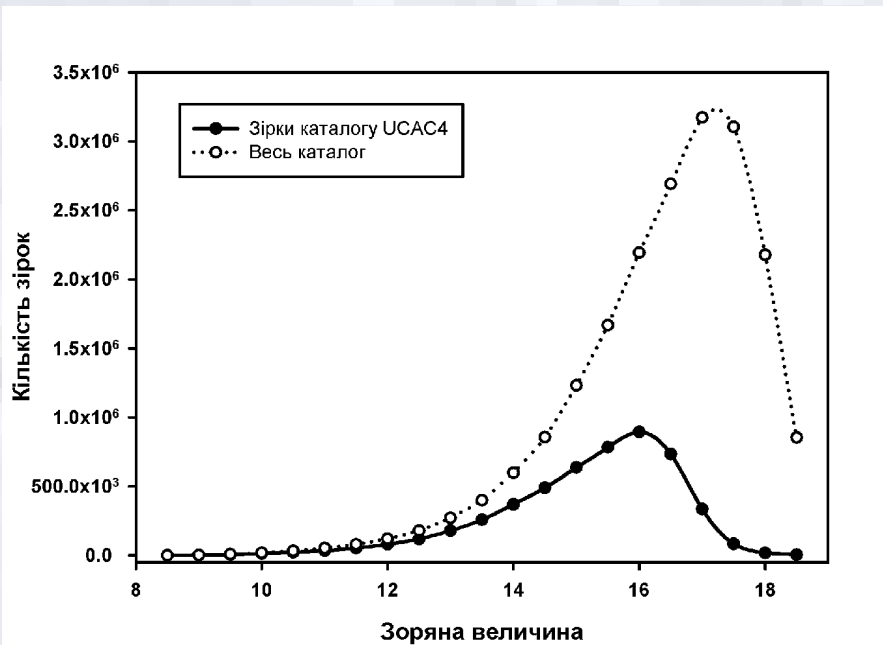
We received a coordinates of more than 235 million objects from more than 160 thousand images from VO and current observations.

Analysis of the obtained results

We made analysis of accuracy of the results from 4 sources by magnitude, coordinates and color band.

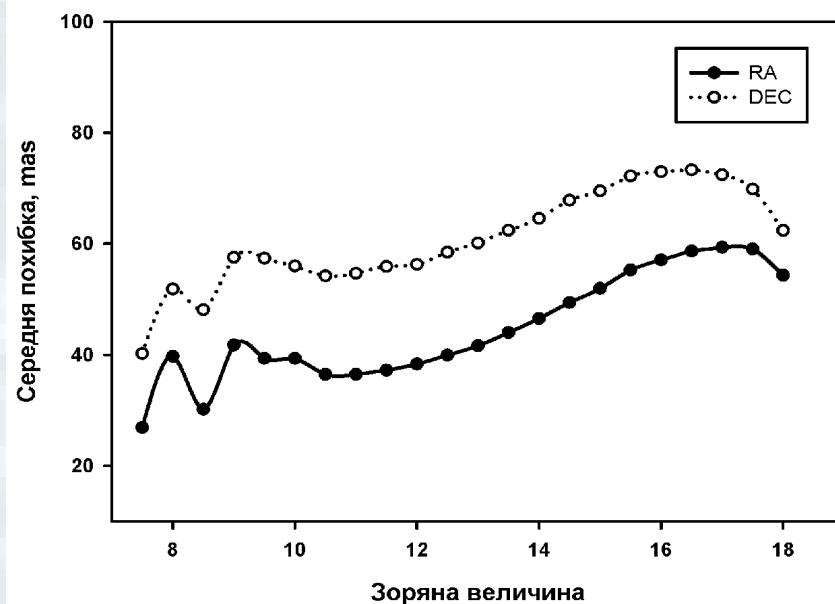
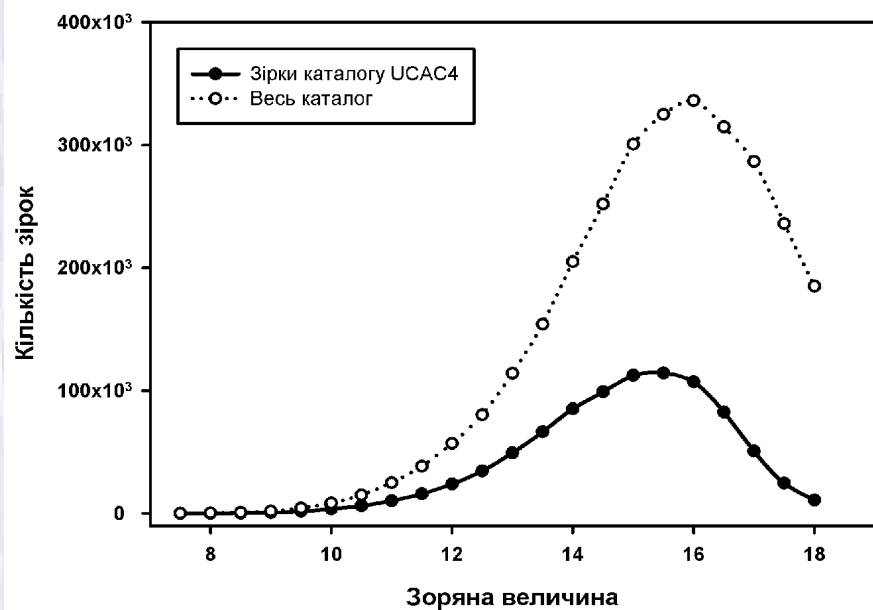


Creation and analysis of the catalogs. 2MASS sources.



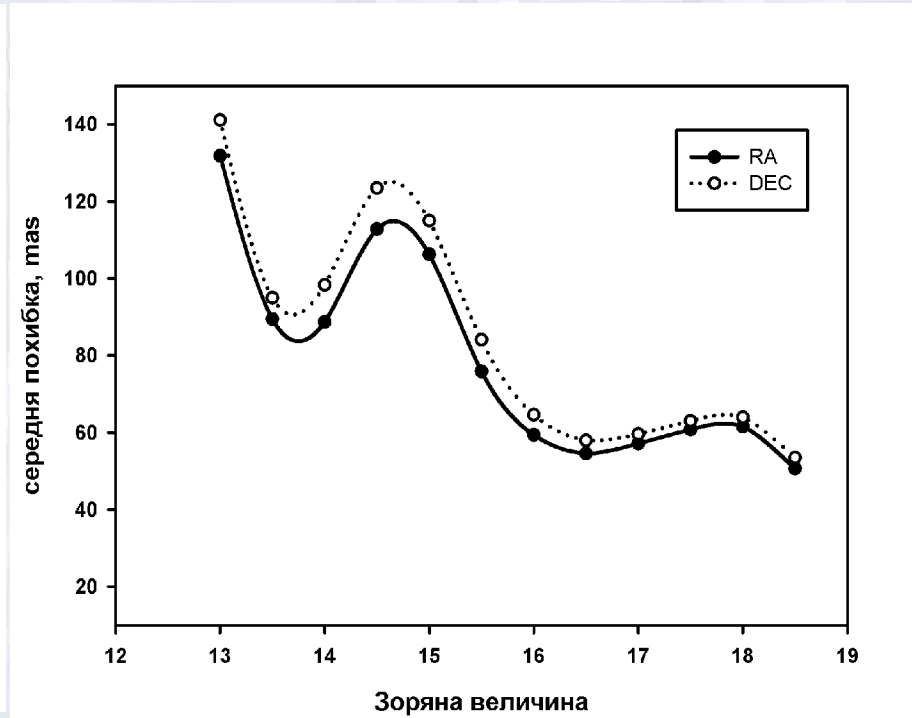
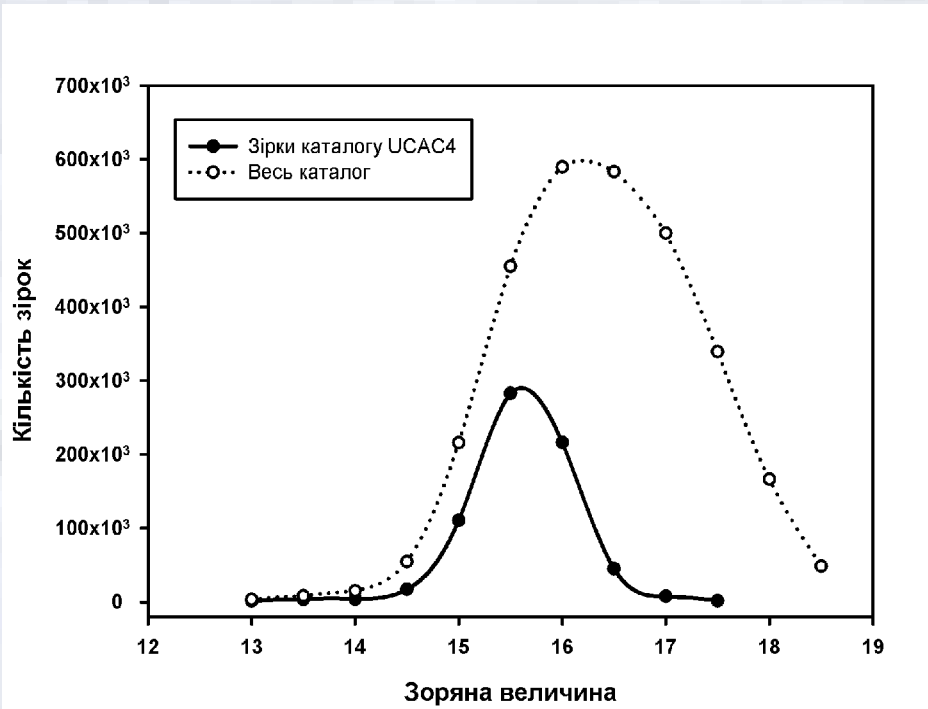
Catalog contain 19.7 million stars 9^m - 18.5^m on epoch 1998.7 with average observation 6.3 and accuracy 40 mas in RA and 39 mas in Dec

Creation and analysis of the catalogs. DENIS sources.



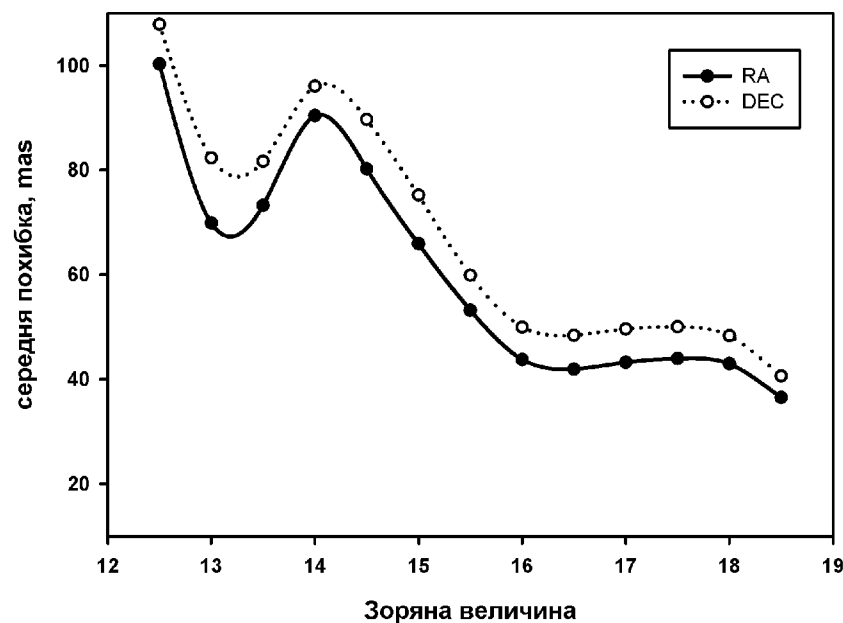
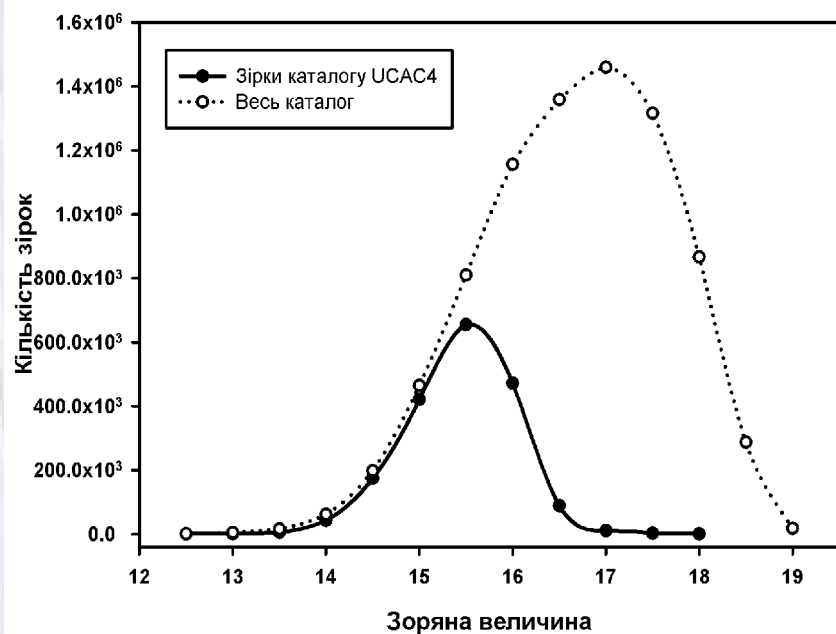
Catalog contain 3.0 million stars 9^m - 18.5^m on epoch 1998.8 with average observation 5.2 and accuracy 52 mas in RA and 68 mas in Dec

Creation and analysis of the catalogs. DSS-A sources.



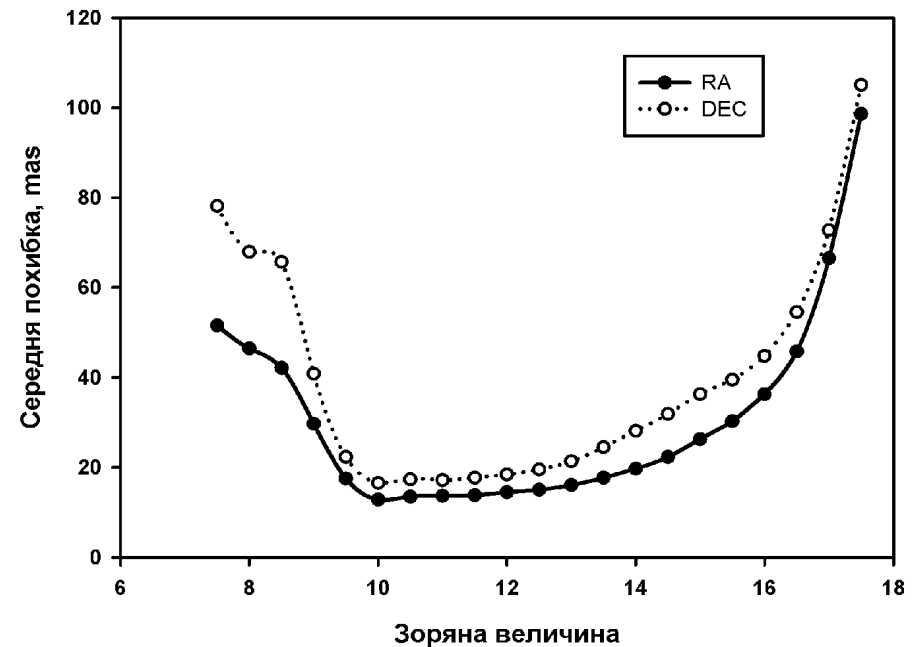
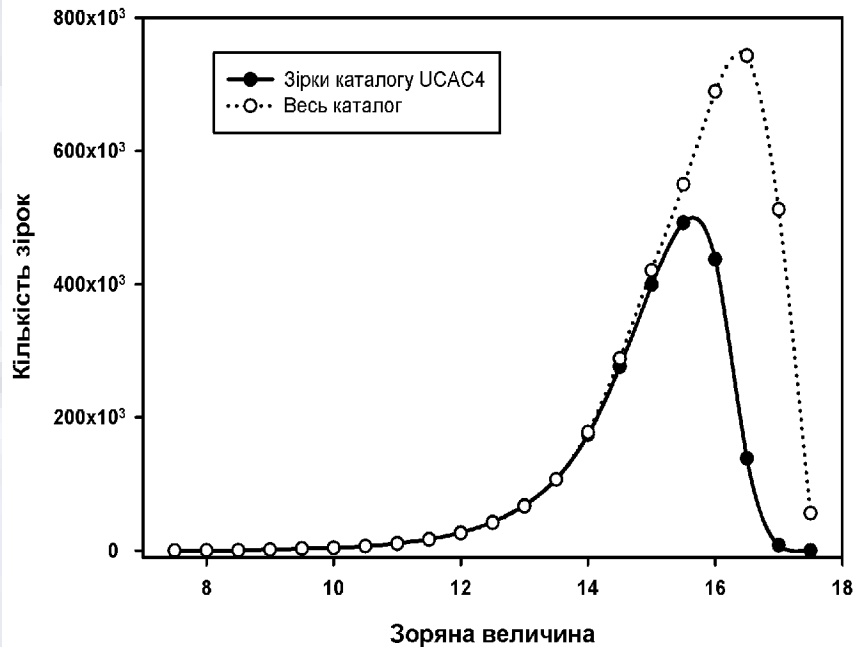
Catalog contain 3.0 million stars 13^m - 18.5^m on epoch 1953.2 with average observation 4.1 and accuracy 65 mas in RA and 70 mas in Dec

Creation and analysis of the catalogs. DSS-B sources.



Catalog contain 8.0 million stars 13^m - 18.5^m on epoch 1988.3 with average observation 5.7 and accuracy 47 mas in RA and 54 mas in Dec

Creation and analysis of the catalogs. Mobitel sources. Exposure 20s.



Catalog contain 3.7 million stars 8^m - 17^m on epoch 2013.5 with average observation 21 and accuracy 29 mas in RA and 38 mas in Dec

Conclusions

All the processing is performed in a single system with the same software.

By using of those catalogs and creating another similar catalogs from other surveys and observations from VO sources, we can create in 2015 the new, more precise catalog of positions and proper motions for the selected regions.



Thank you for attention!

