

# DETERMINATION OF PROPER MOTIONS OF CIRCUMPOLAR STARS BY USING IMAGES FROM UKRVO PLATE ARCHIVES

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# Input data with Dec $> 65^\circ$

- RI NAO – Total plates in DB -196, use 34 plates, mean epoch - 1930.3, practically no overlap with Dec  $< 80^\circ$ , and overlap 2 times on plates border
- MAO – Total plates in DB near 2000, use 161 plates, mean epoch – 1985.7, overlap near 4 times

# Scanning and X,Y receiving

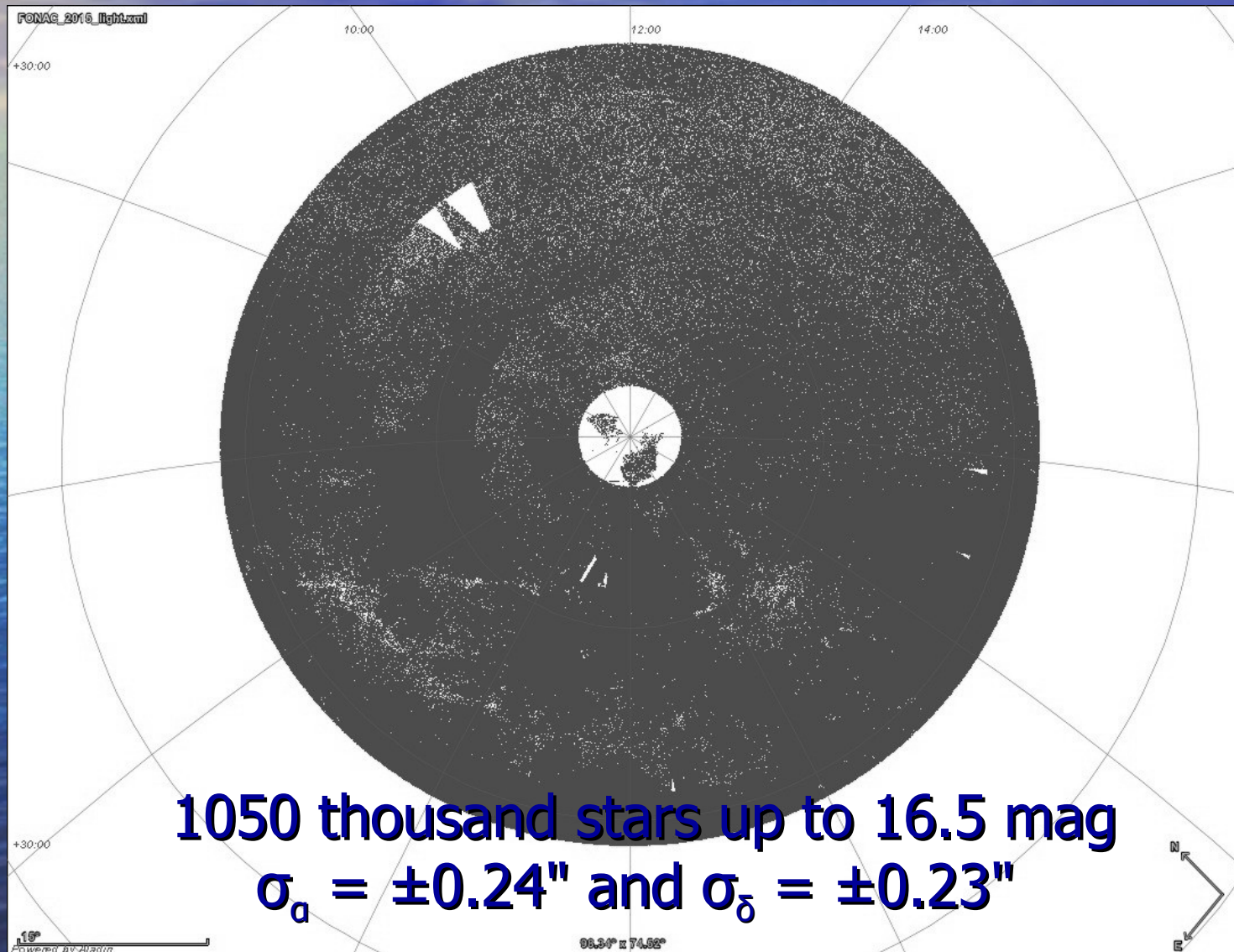
- MAO – scan with 1200DPI; 1 time; X,Y by MIDAS
- NAO – scan with 1200, 1500, 1600DPI; 5-6 times; X,Y by MIDAS

# Astrometric reduction

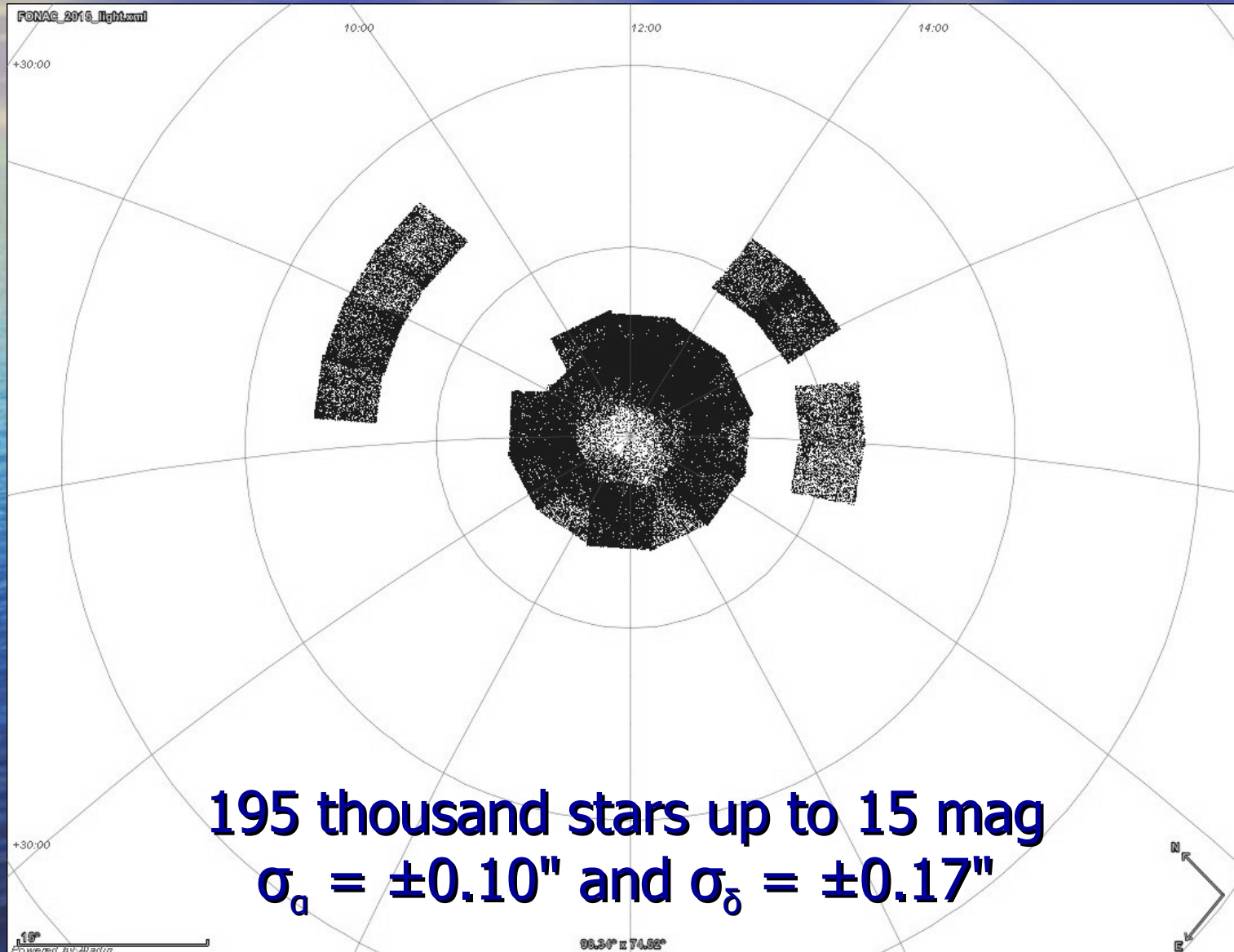
- NAO – 00plate in Tycho 2 system
- MAO – plate\_gr in Tycho 2 system

to compare their behavior near the pole

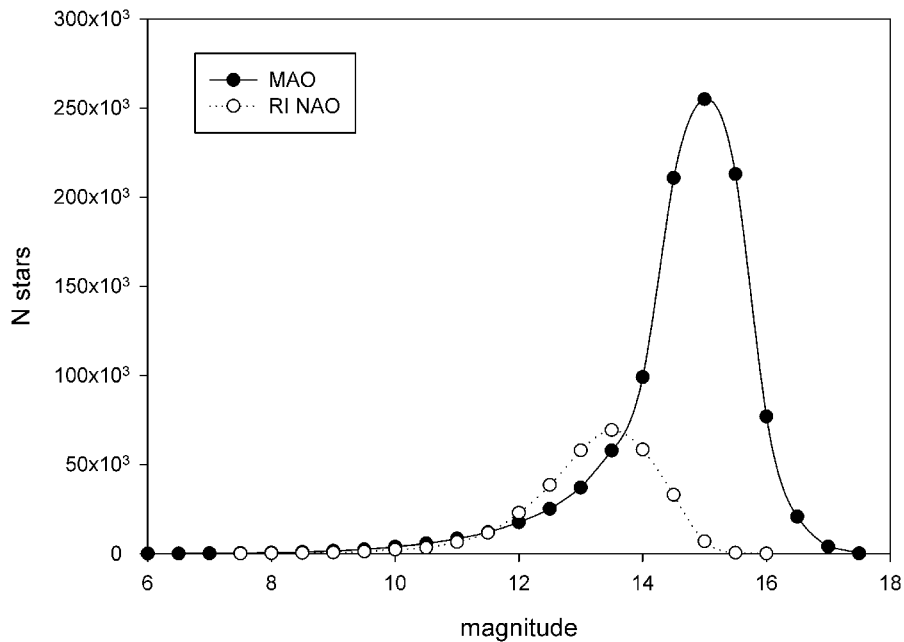
# Full catalog from MAO plates



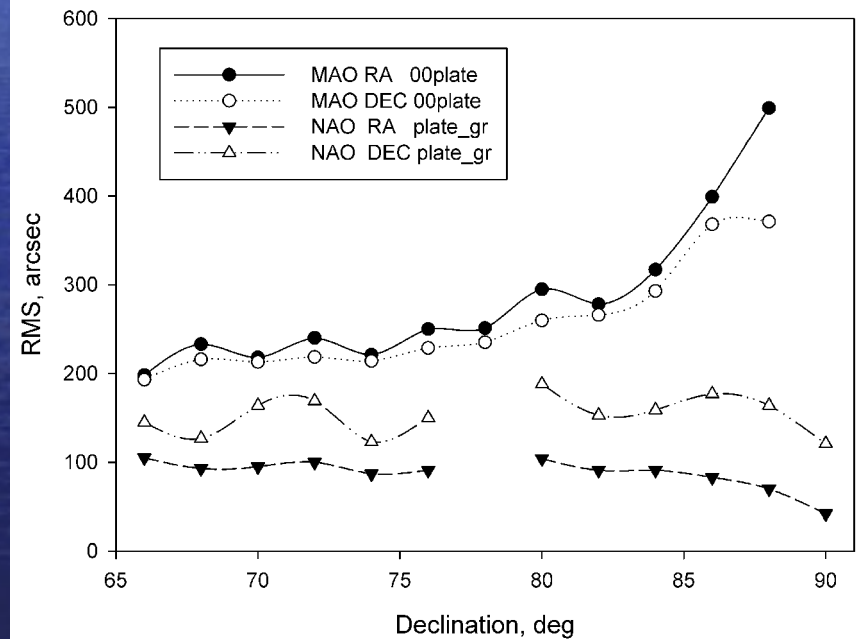
# Catalog from NAO plates



# Distribution of input catalogs

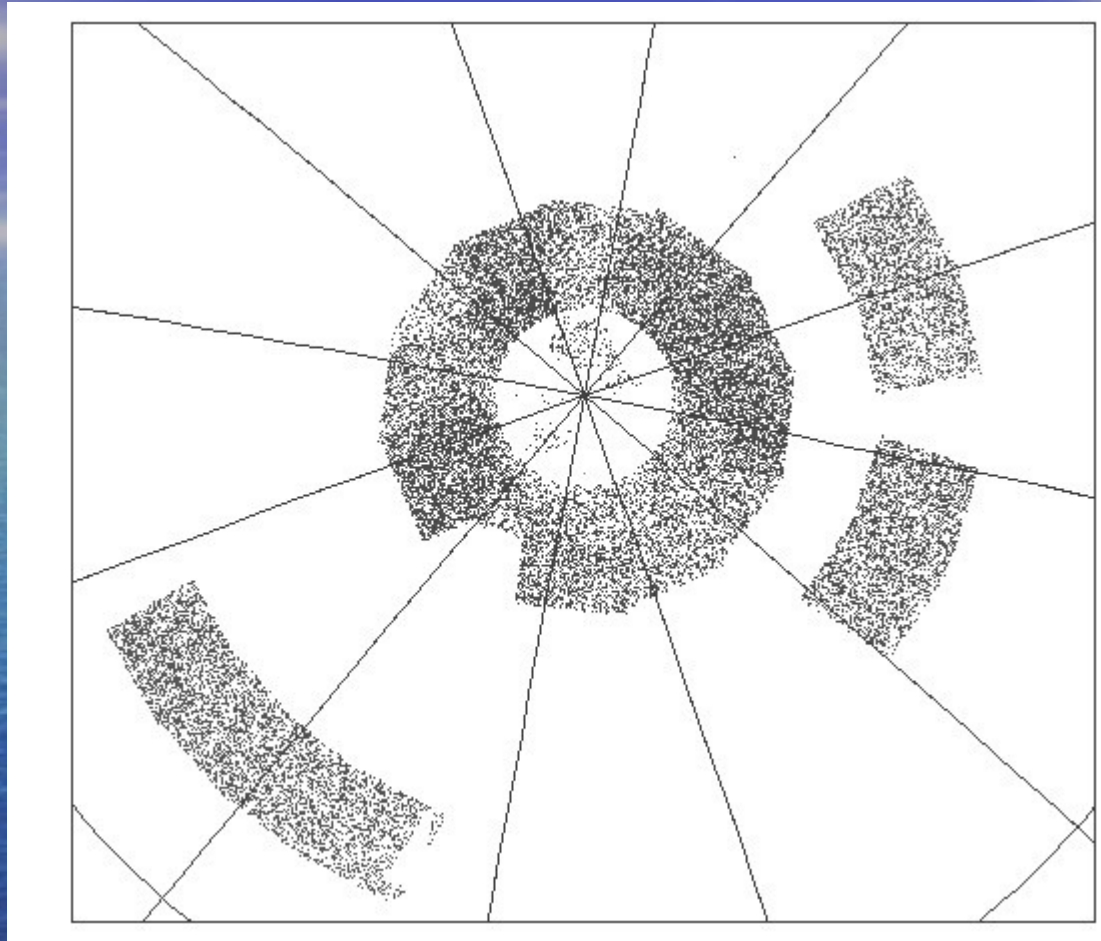


By magnitude



By accuracy

# Common stars

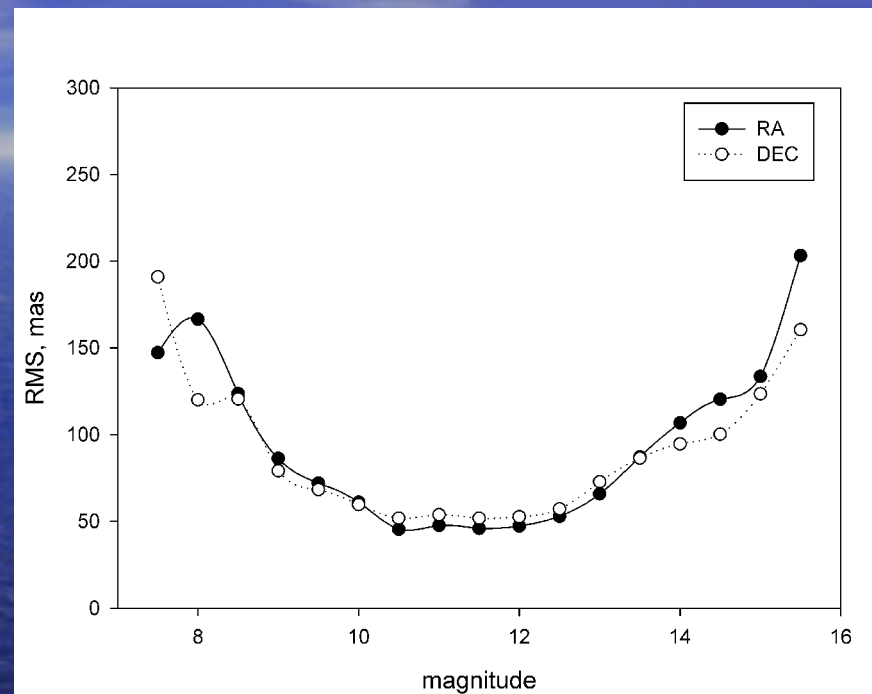
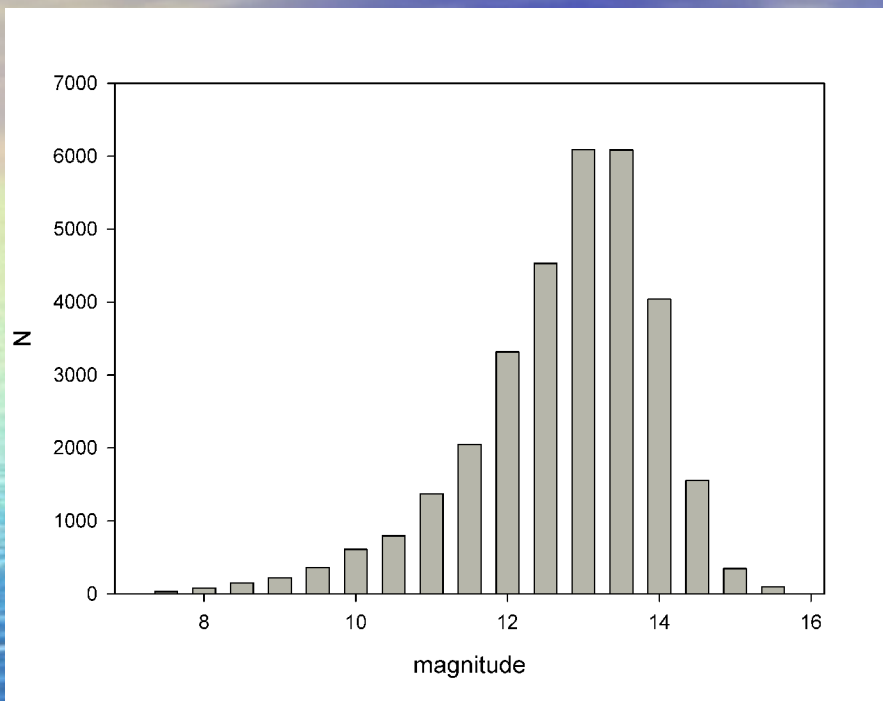


we compare 3 regions:  $65-70^\circ$ ,  $72-77^\circ$  and  $80-86^\circ$

MAO -  $\sigma_{\alpha/\delta} = \pm 0.22''/\pm 0.21''$ ,  $\pm 0.24''/\pm 0.23''$ ,  $\pm 0.31''/\pm 0.29''$

NAO -  $\sigma_{\alpha/\delta} = \pm 0.10''/\pm 0.14''$ ,  $\pm 0.09''/\pm 0.14$ ,  $\pm 0.09''/\pm 0.17''$

# Catalog of coordinates and proper motion



near 30 thousand stars,

mean RMS of catalog position is 73 mas in both coordinates,

mean errors of proper motion are 1.4 mas/year in RA and 1.7 mas/year in DEC

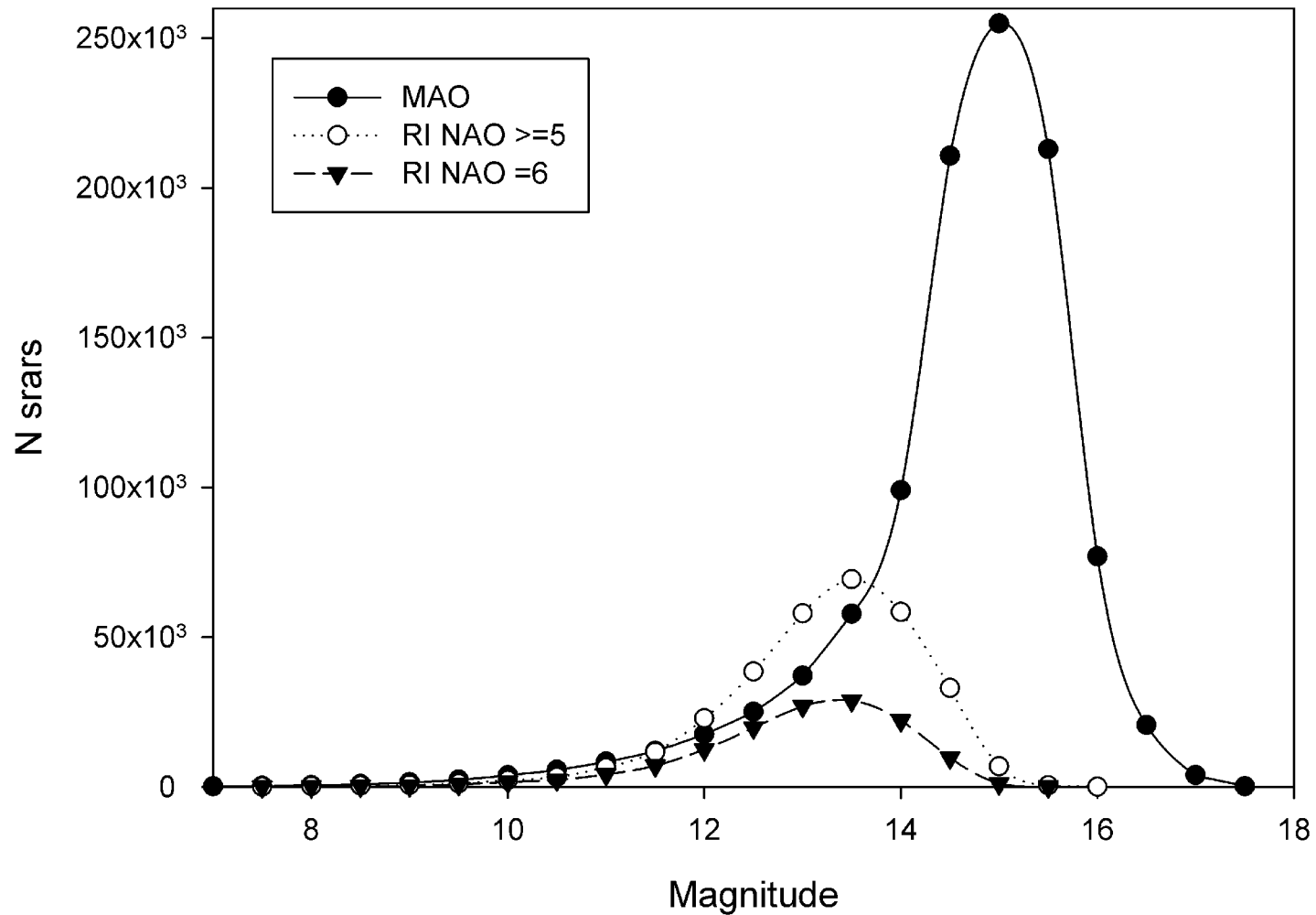
# Conclusions

- Must improve 00plate program to work in circumpolar zone  $> 80^\circ$
- The obtained result suggests the advisability of processing of all NAO's plates with epoch near 1930 to receive proper motions of stars up to  $14\text{-}15^m$  in the declination zone of  $65^\circ$  to  $90^\circ$ .

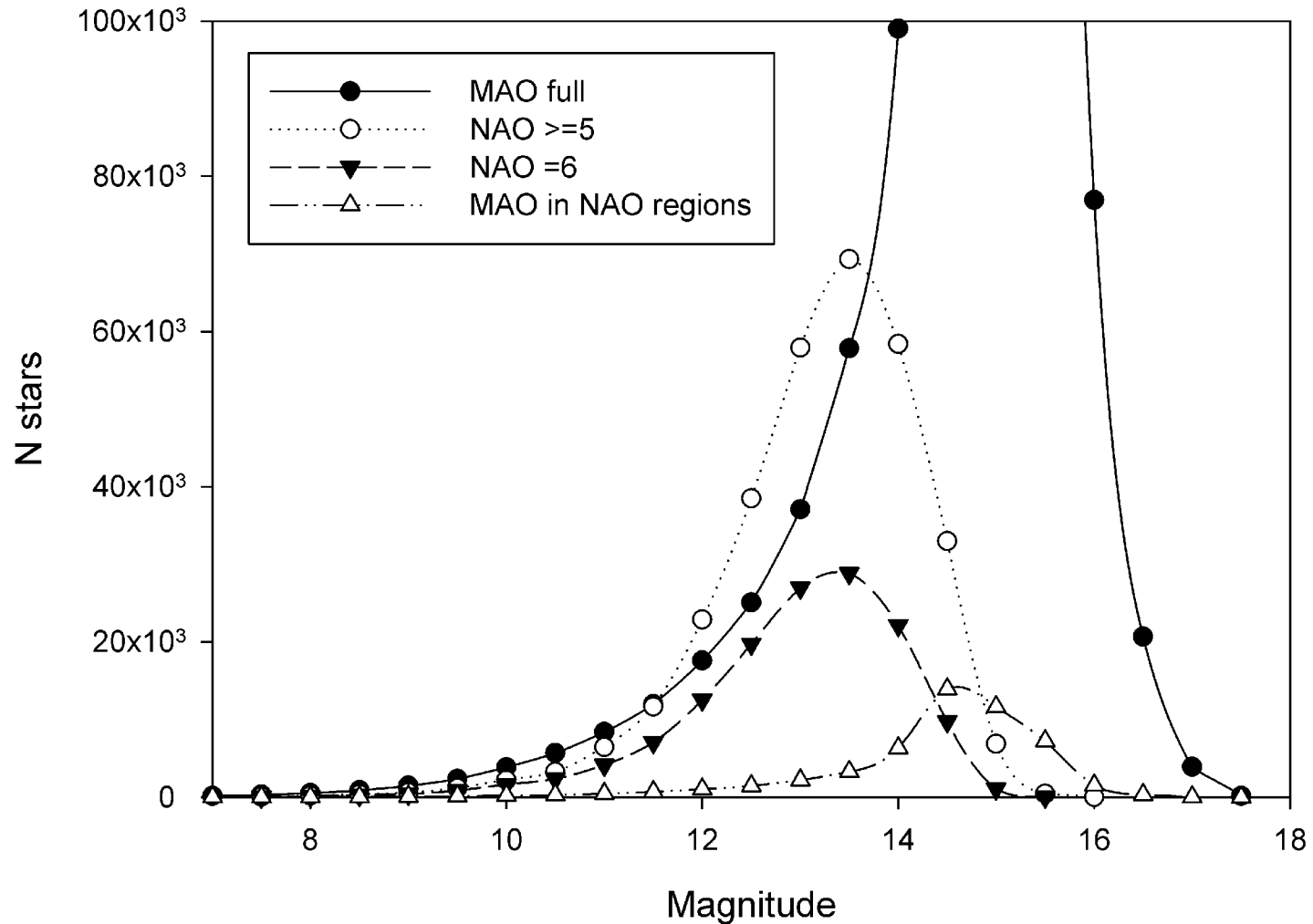


**Thank you for attention!**





116 thousand stars in NAO with  $n=6$



51 thousand stars from MAO catalog in NAO regions  
 36 thousand stars with mag<15  
 23 thousand stars with mag<14.5