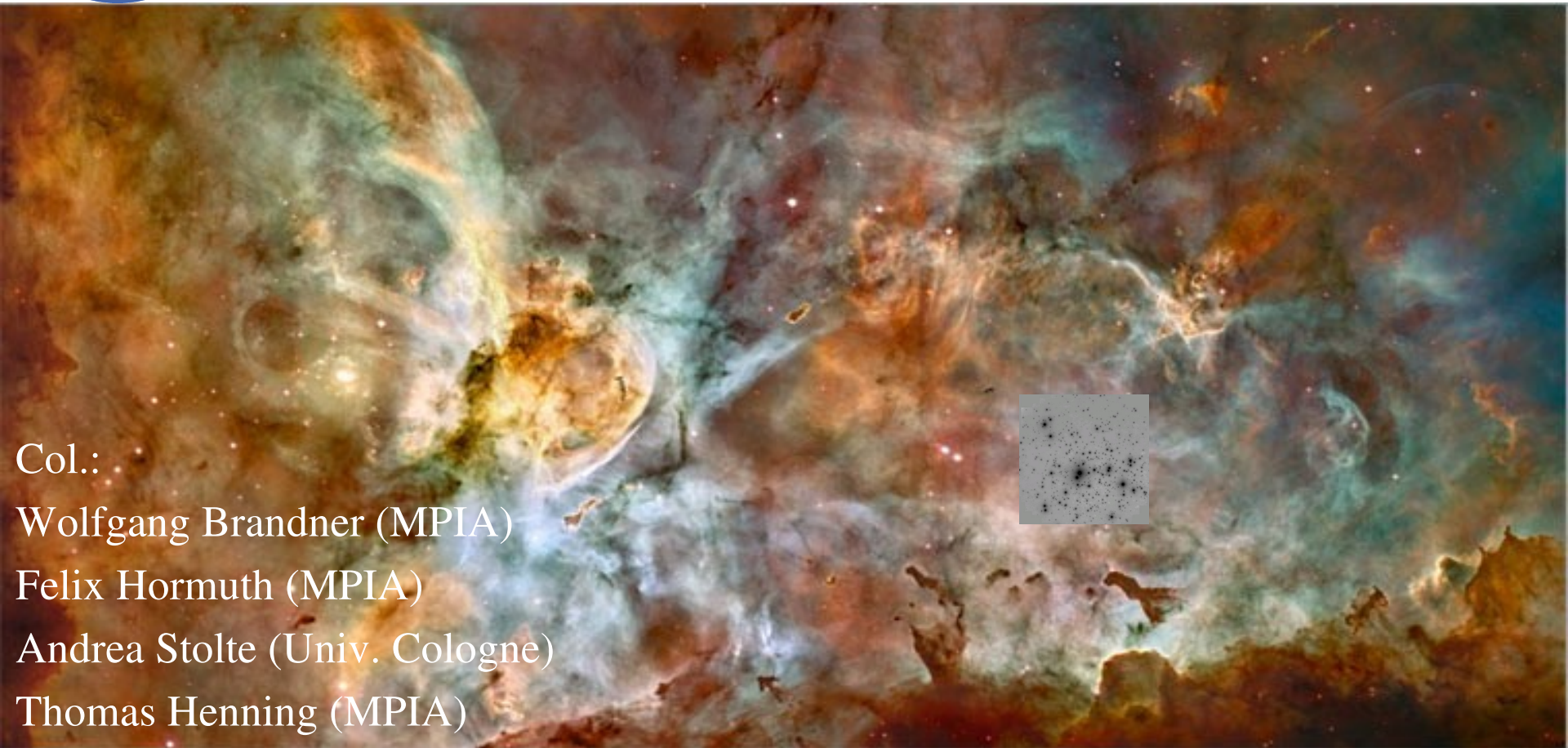




Trumpler 14 in the Carina Nebula



Col.:

Wolfgang Brandner (MPIA)

Felix Hormuth (MPIA)

Andrea Stolte (Univ. Cologne)

Thomas Henning (MPIA)

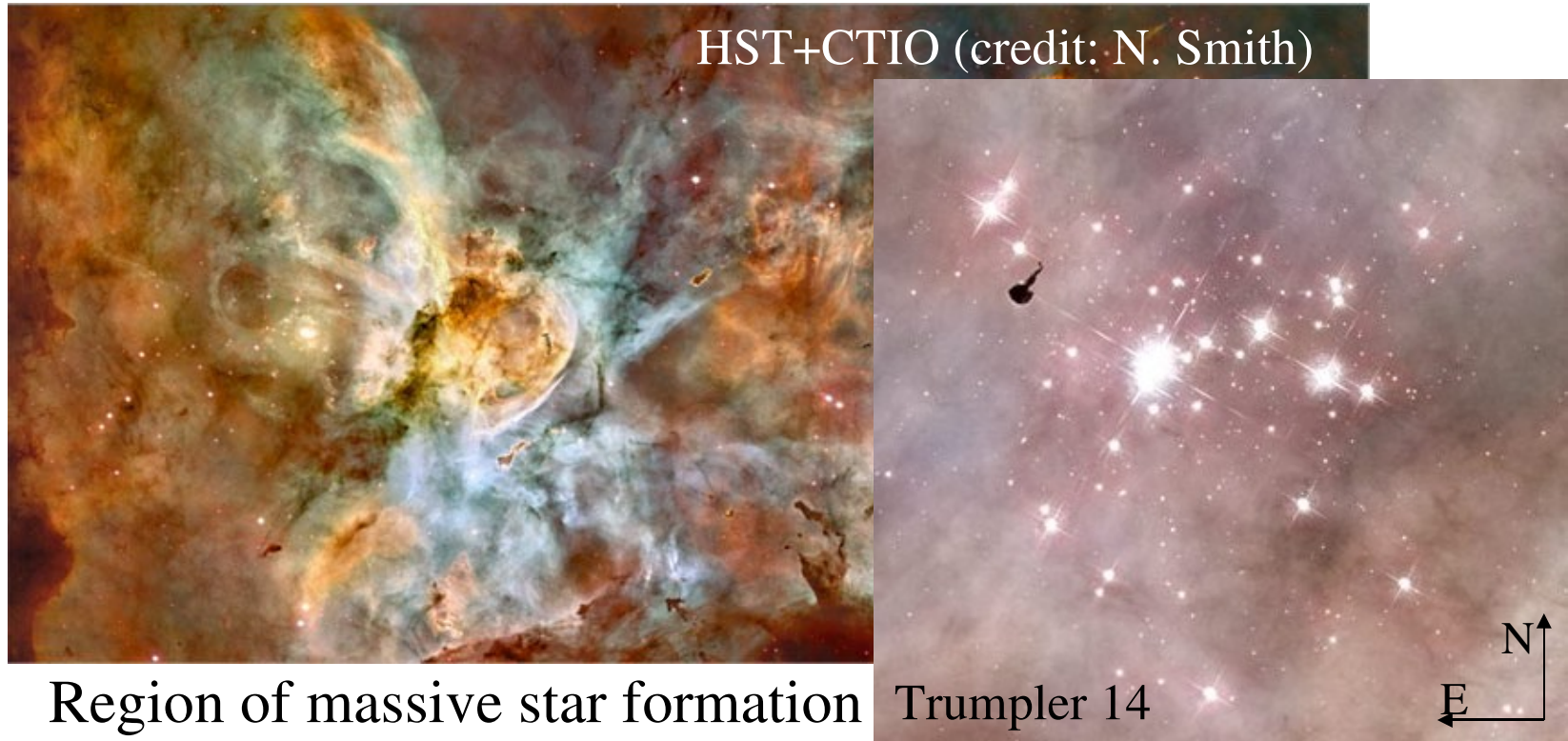
Boyke Rochau

MPIA, Heidelberg

Overview

- Where do we look at (Introduction)
- How good do we see (Performance)
- What do we see (Photometry)
 - calibration with NTT/SofI obs. (Ascenso et al.)
 - Color-magnitude diagram

Where do we look at



HST+CTIO (credit: N. Smith)

Trumpler 14

- Region of massive star formation
- Distance ~ 3 kpc
- Includes young clusters Trumpler 14 + 16
-> LBV Eta Carina in Tr 16

Trumpler 14

- Extensively studied object:
(few) e.g.: DeGoia-Eastwood et al. 2001, Tapia et al. 2003, Carraro et al. 2004, Ascenso et al. 2007...
- Continuous star formation since (at least) 5 Myr
- Several O- and B-type stars

NIR view of Tr14

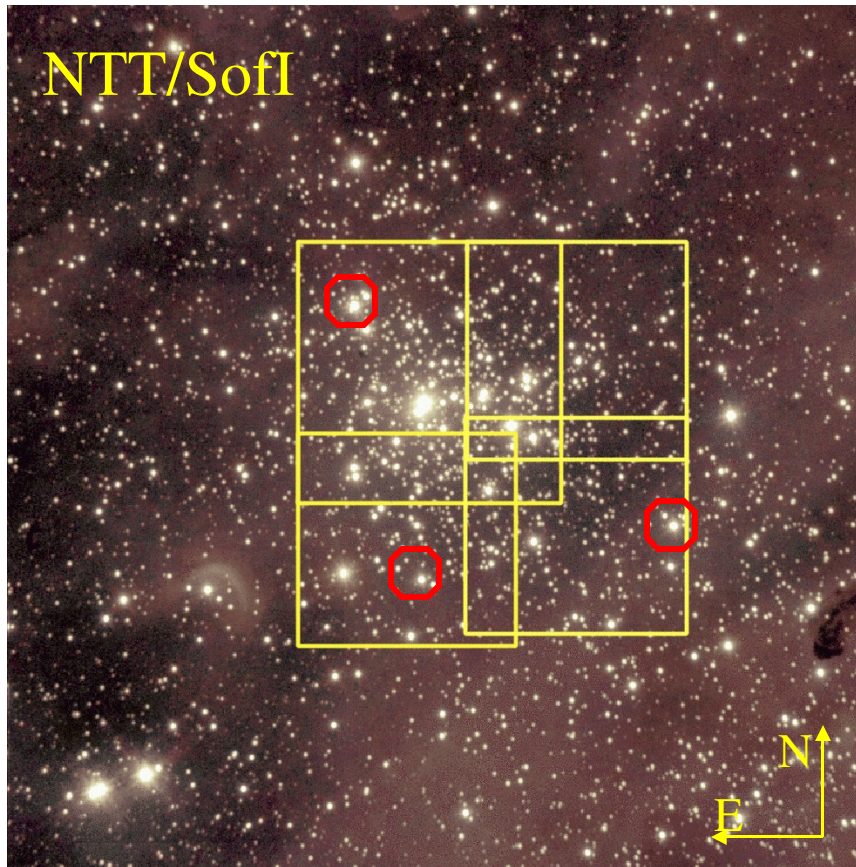
NTT/SofI (Ascenso et al. 2007)



Ascenso et al. 2007:

- Tr14 with NTT/SofI
- JHKs composit with ~4'x4' FoV
- Thousands of stars (almost 5,000)

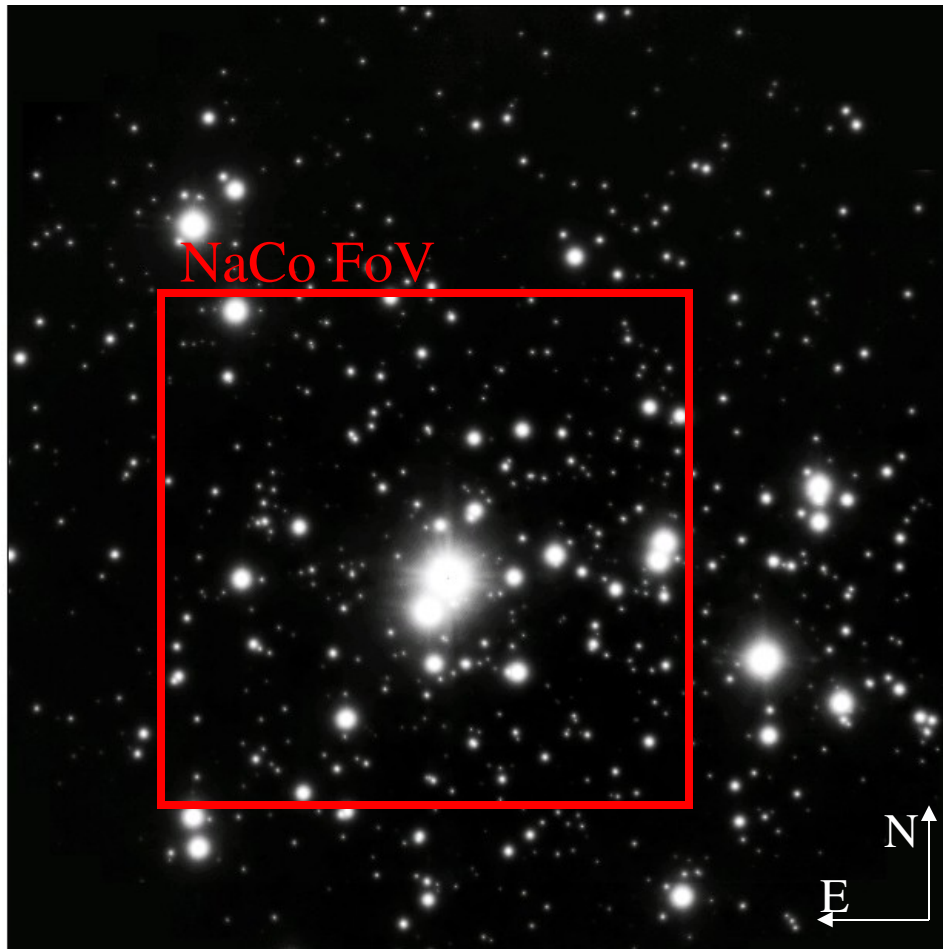
MAD observations



- 4 Fields observed in H, Ks
- 4 fields (1x $\sim 70'' \times 70''$ FoV, 3x $\sim 60'' \times 60''$ FoV)
- 3 guide stars (red circles)

Tr14 seen with MAD

H-band



Central field:

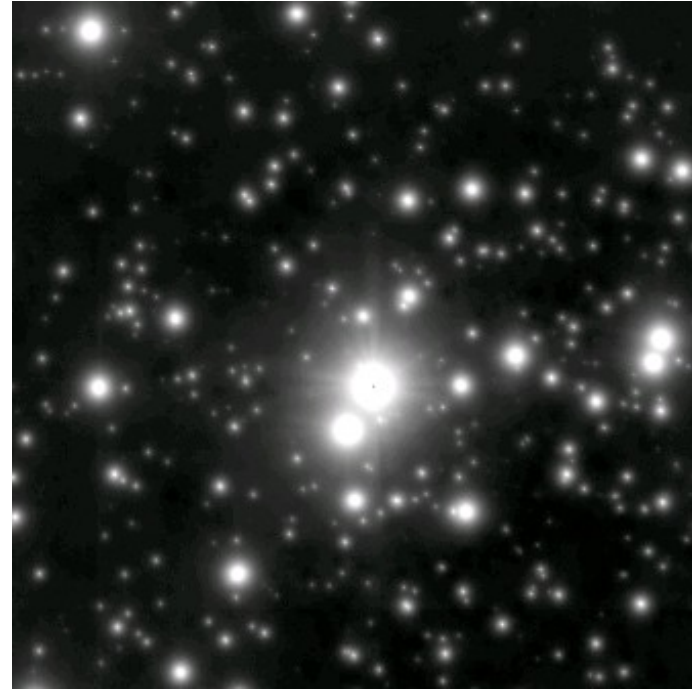
- FoV: $\sim 70'' \times 70''$
- H-band (1800s)
- Ks-band (1800s)

Comparison NaCo - MAD

NaCo

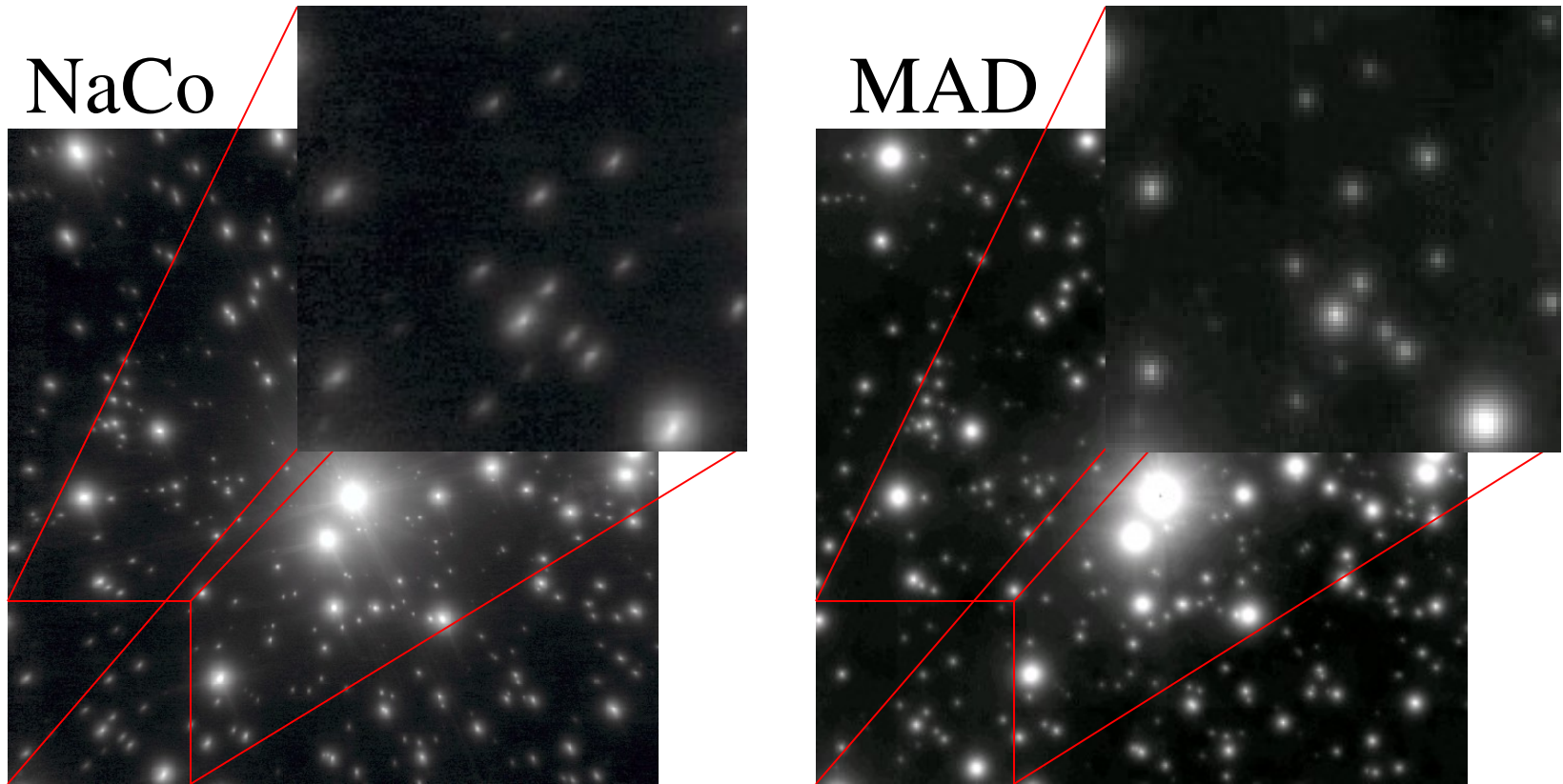


MAD



- Effect of anisoplanatism visible over NaCo field
- No apparent elongation of the MAD PSF

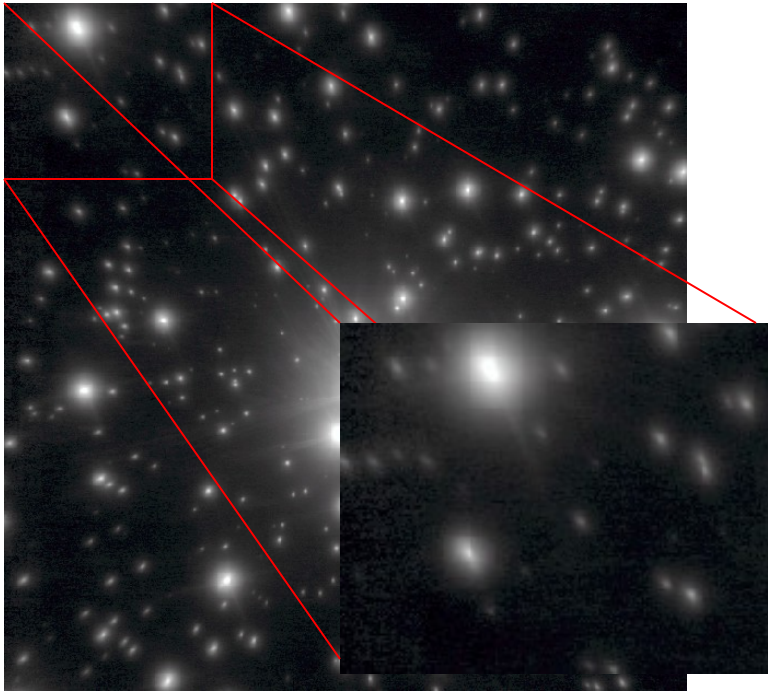
NaCo vs. MAD zoom-in



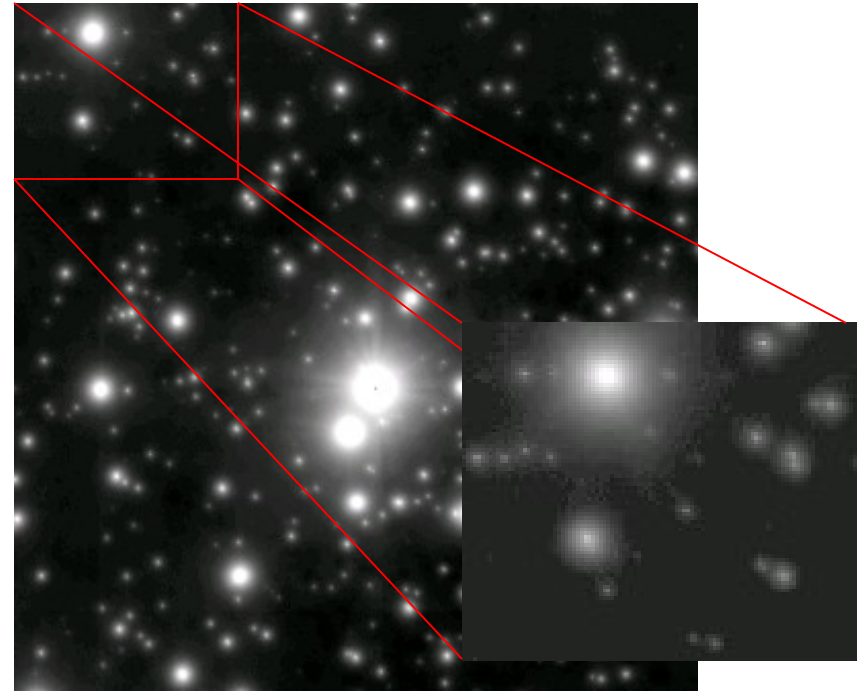
- Elongated PSF in outskirts of the NaCo field
- MAD: most stars have ellipticities $e < 0.1$

NaCo vs. MAD zoom-in

NaCo

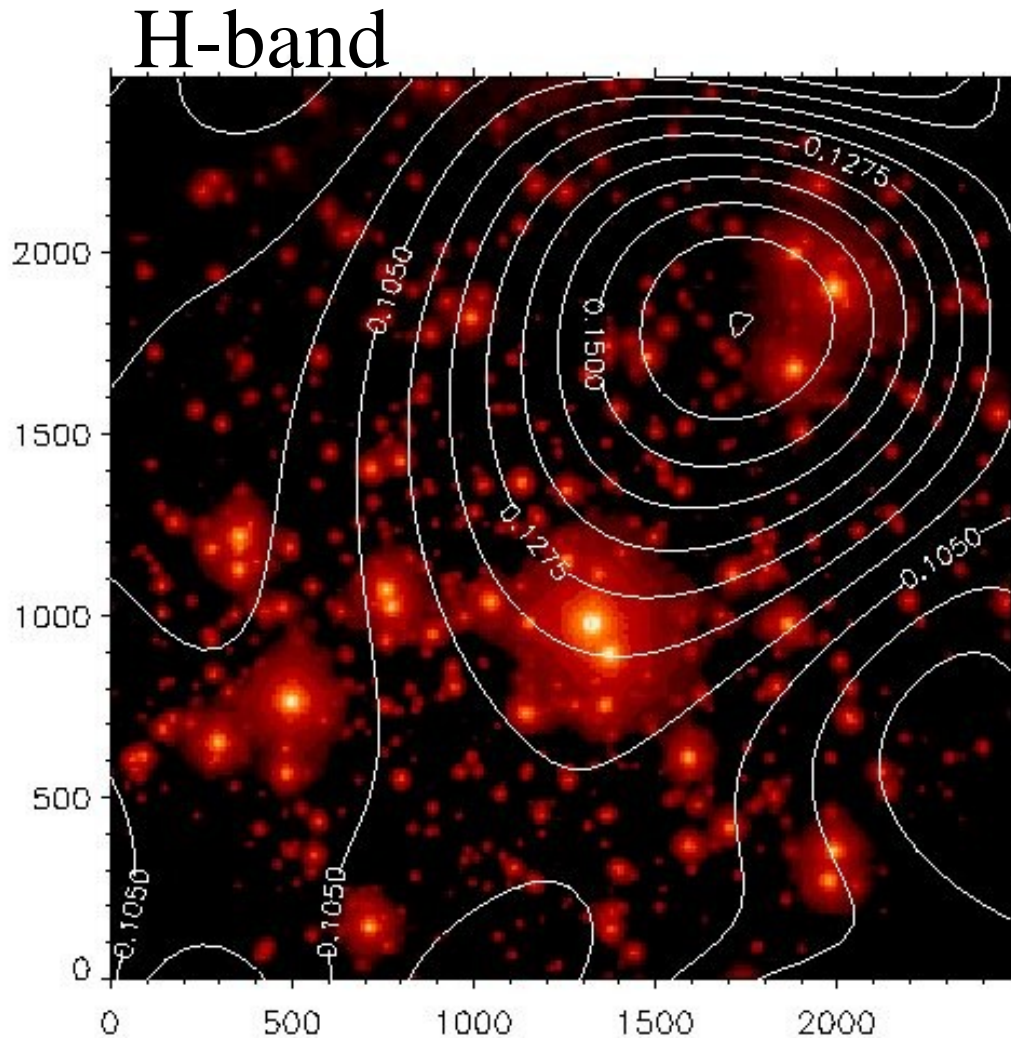


MAD



- Elongated PSF in outskirts of the NaCo field
- MAD: most stars have ellipticities $e < 0.1$

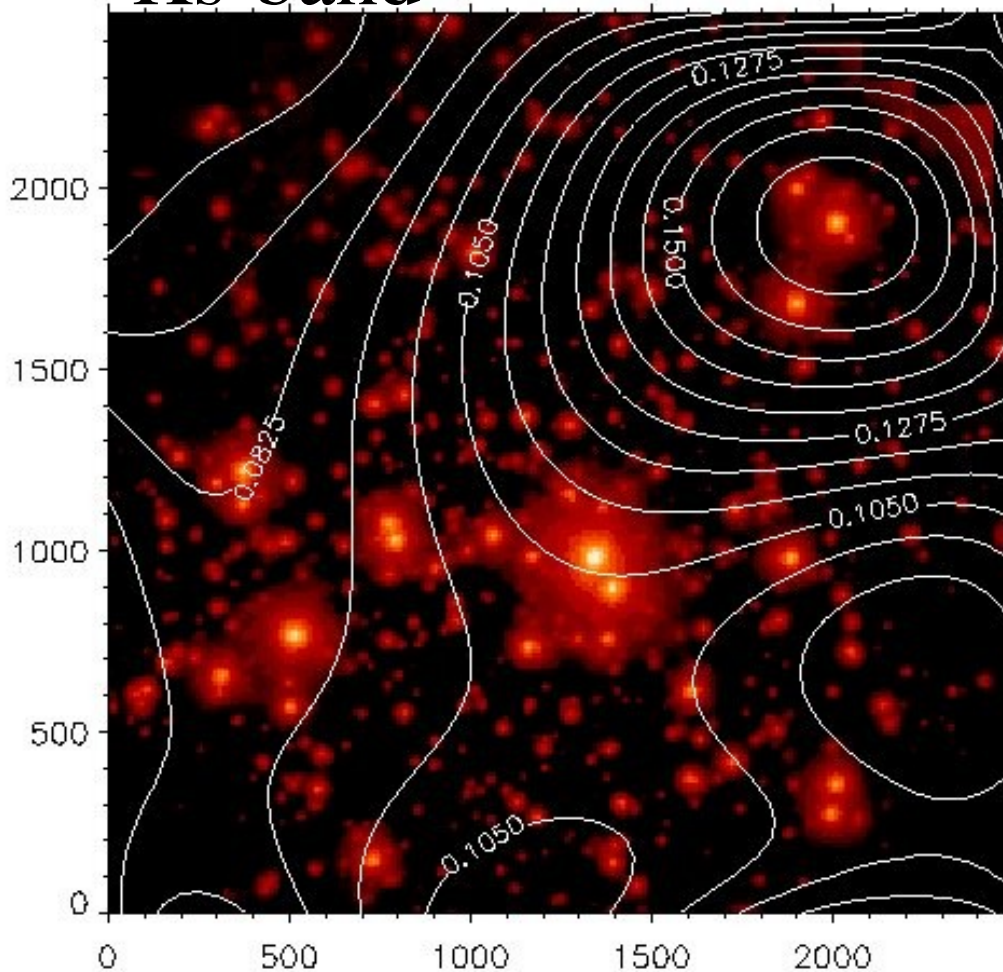
Spatial distribution of Strehl ratios



- Peak value: 17.3
- Lowest Strehl: 7.8
-> isoplanatic angle larger than FoV

Spatial distribution of Strehl ratios

Ks-band

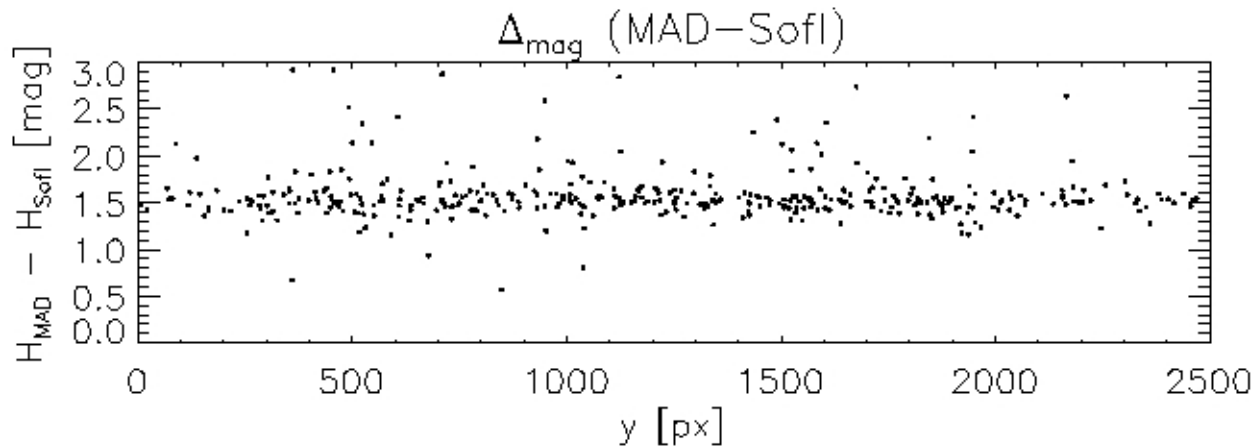
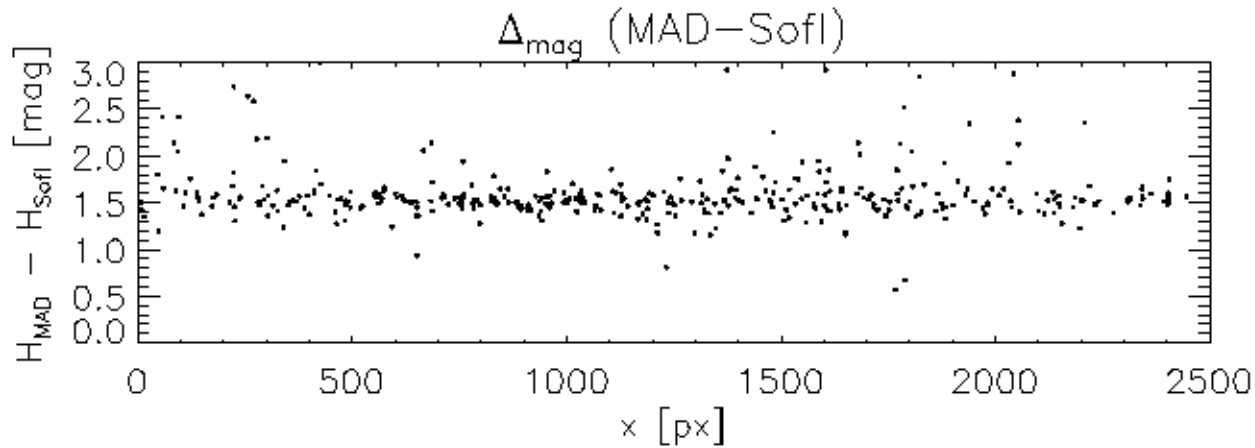


- Peak value: ~ 19.6
- Lowest Strehl: ~ 7
-> isoplanatic angle $\sim \text{FoV}$

Photometry

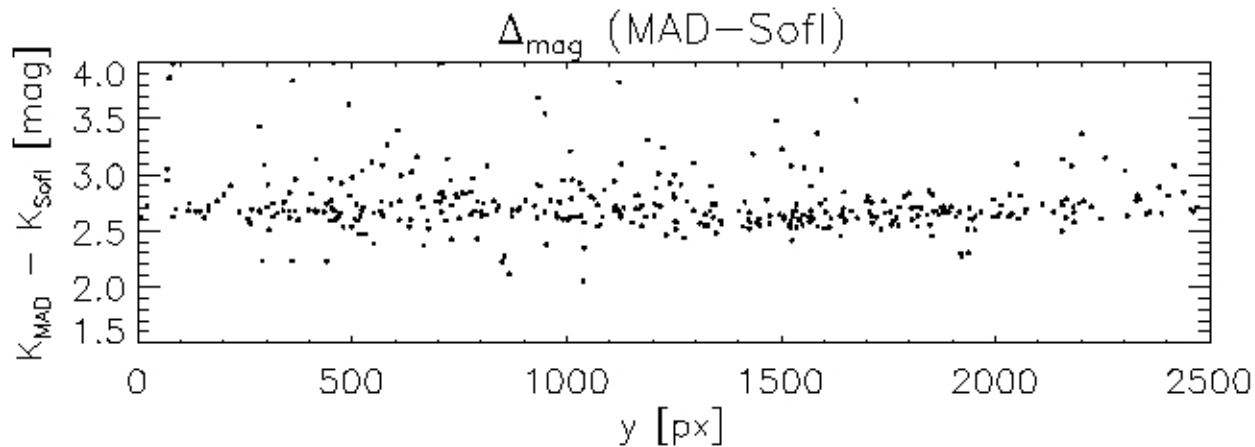
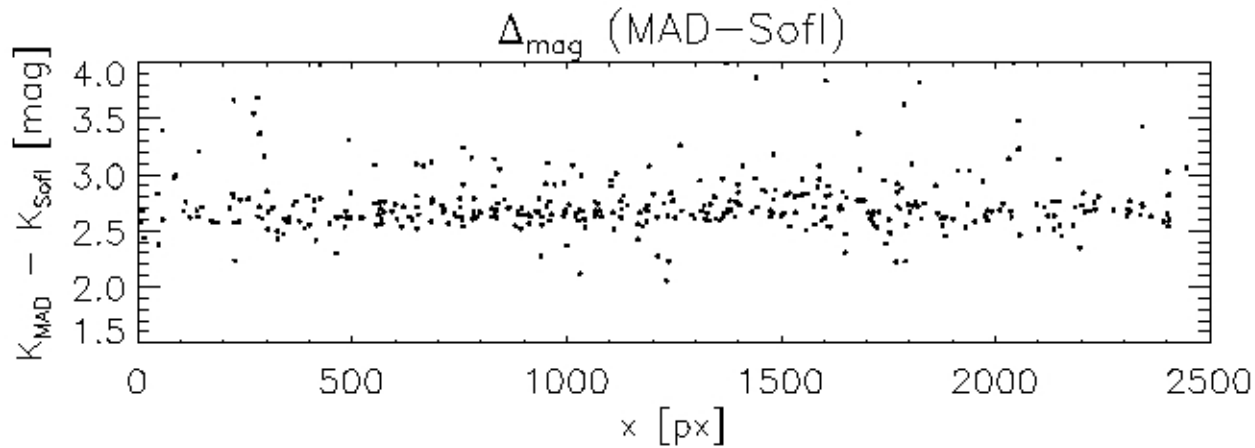
- IRAF/DAOPHOT
 - PSF photometry with 2nd order variable Penny-PSF
- Photometry calibration with photometry given by Ascenso et al. 2007

SofI - MAD



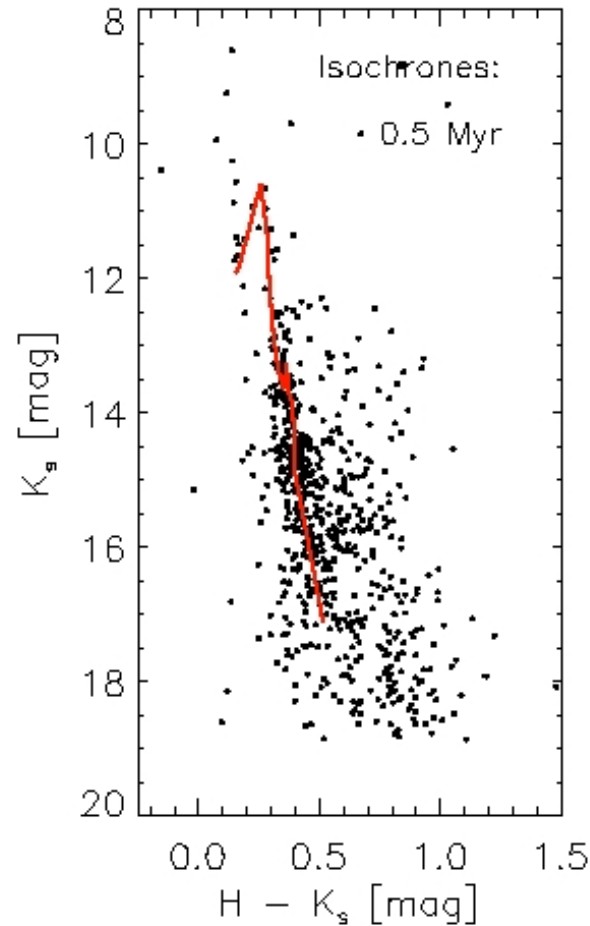
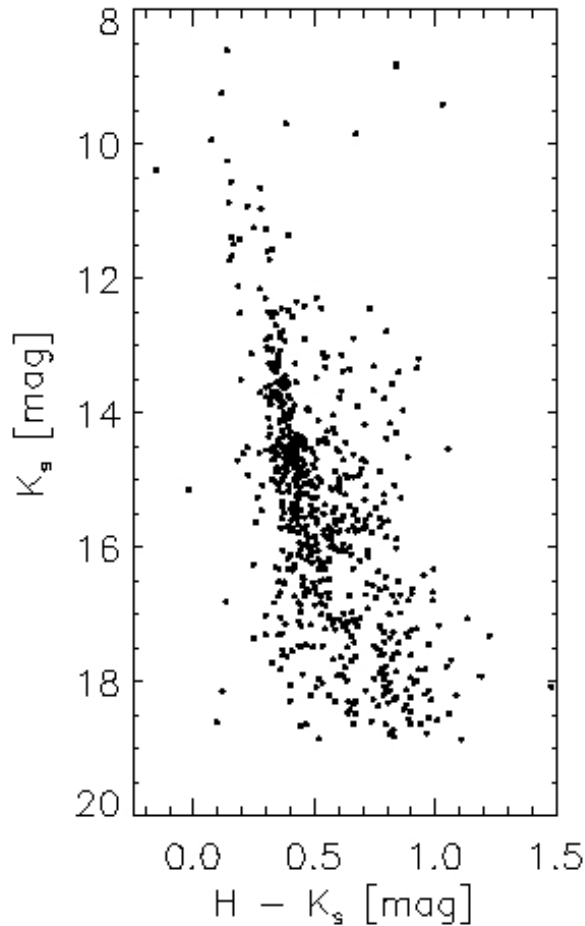
- Offset in H-band:
1.52 mag
(DAOPHOT-ZP=25mag)

SofI - MAD



- Offset in Ks-band:
2.675 mag
(DAOPHOT-ZP=25mag)

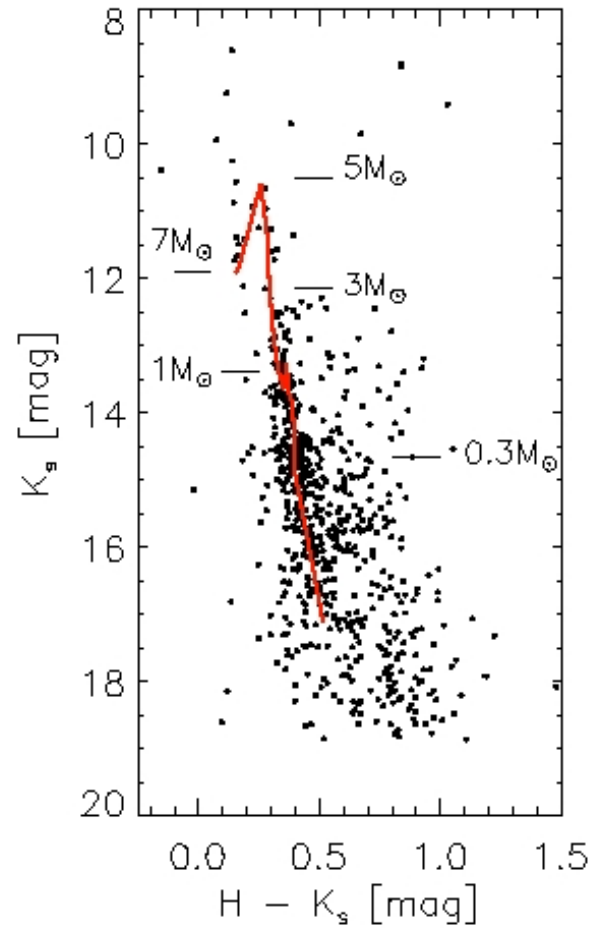
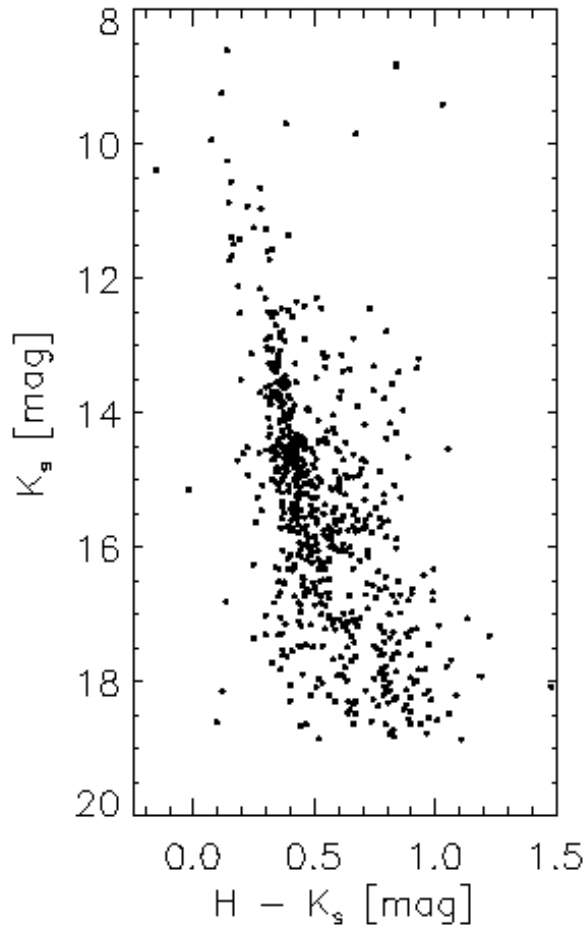
H,H-K_s CMD of Tr14



- DM=12.25mag
-> 2.8 kpc
- A_v=2.8mag

Isochrones: Siess et al. 2000 (transformation to observational plane by Da Rio et al. 2009)

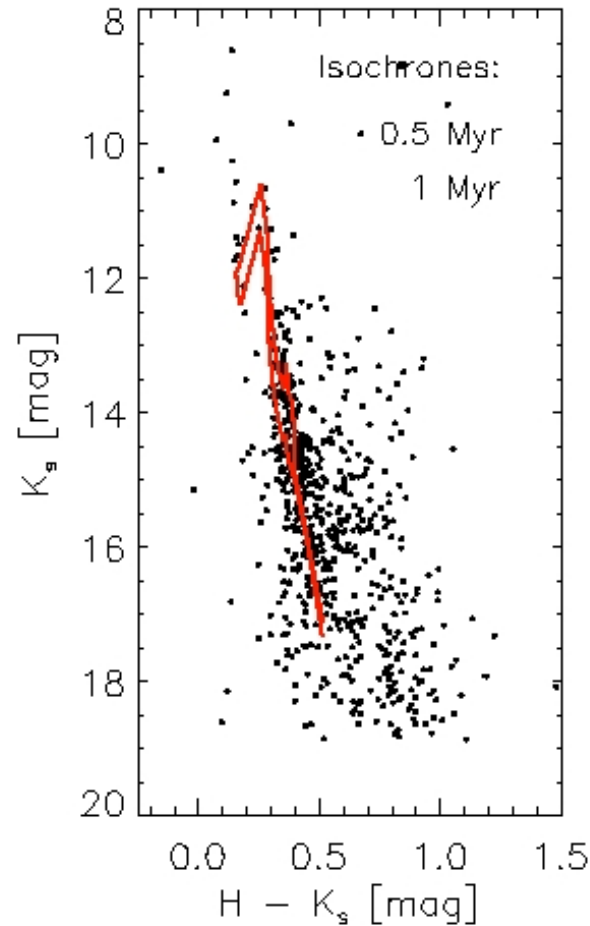
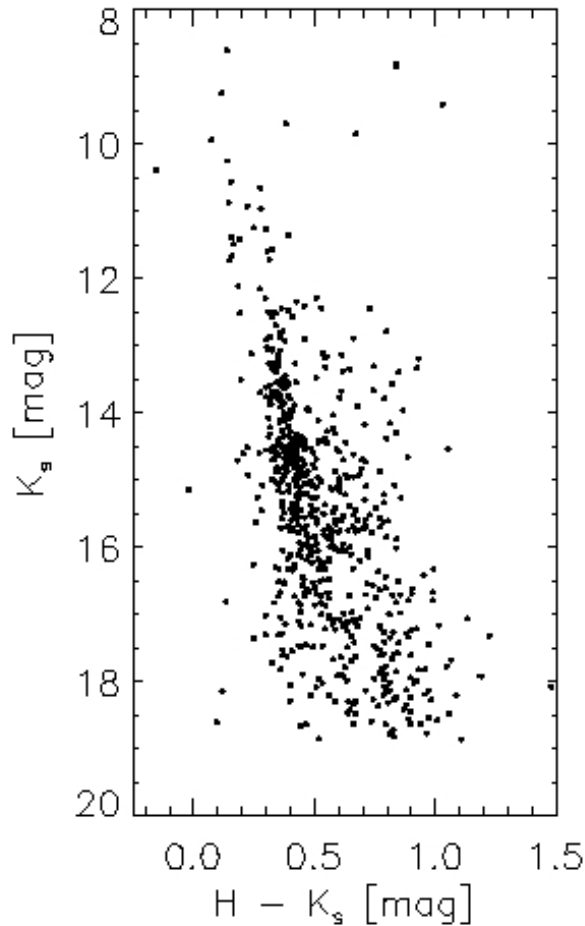
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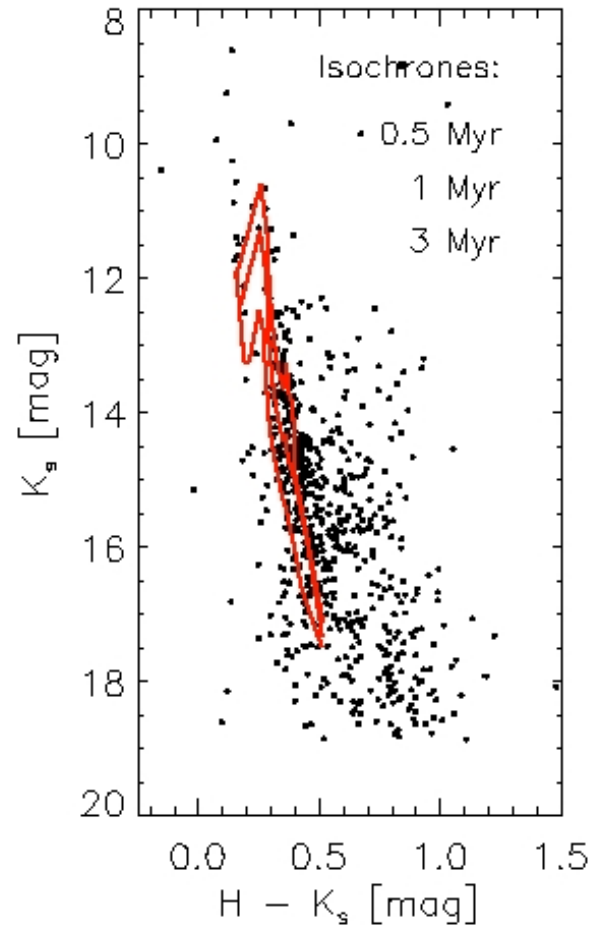
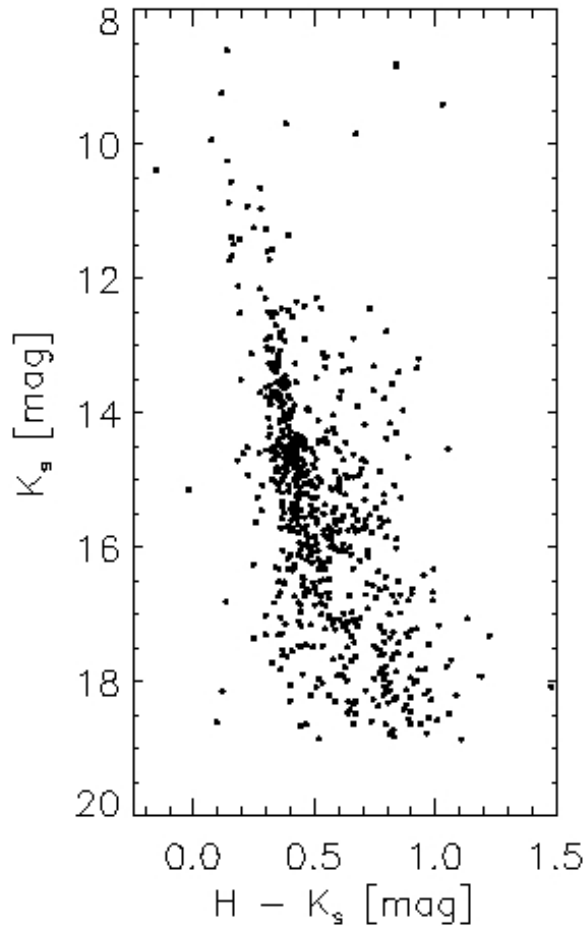
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Summary

- H, K_s (1800s) observations of the core of Tr14
- Isoplanatic angle of the order of the 1' FoV
- Iso. overplotted with DM=12.25 mag (~2.8 kpc) and A_v=2.8mag
 - Confirm continuous SF between 0.5 (or less) - 3 Myr in the core of Trumpler 14