

CASE-FOMBS
Follow-up of One Million Bright Stars

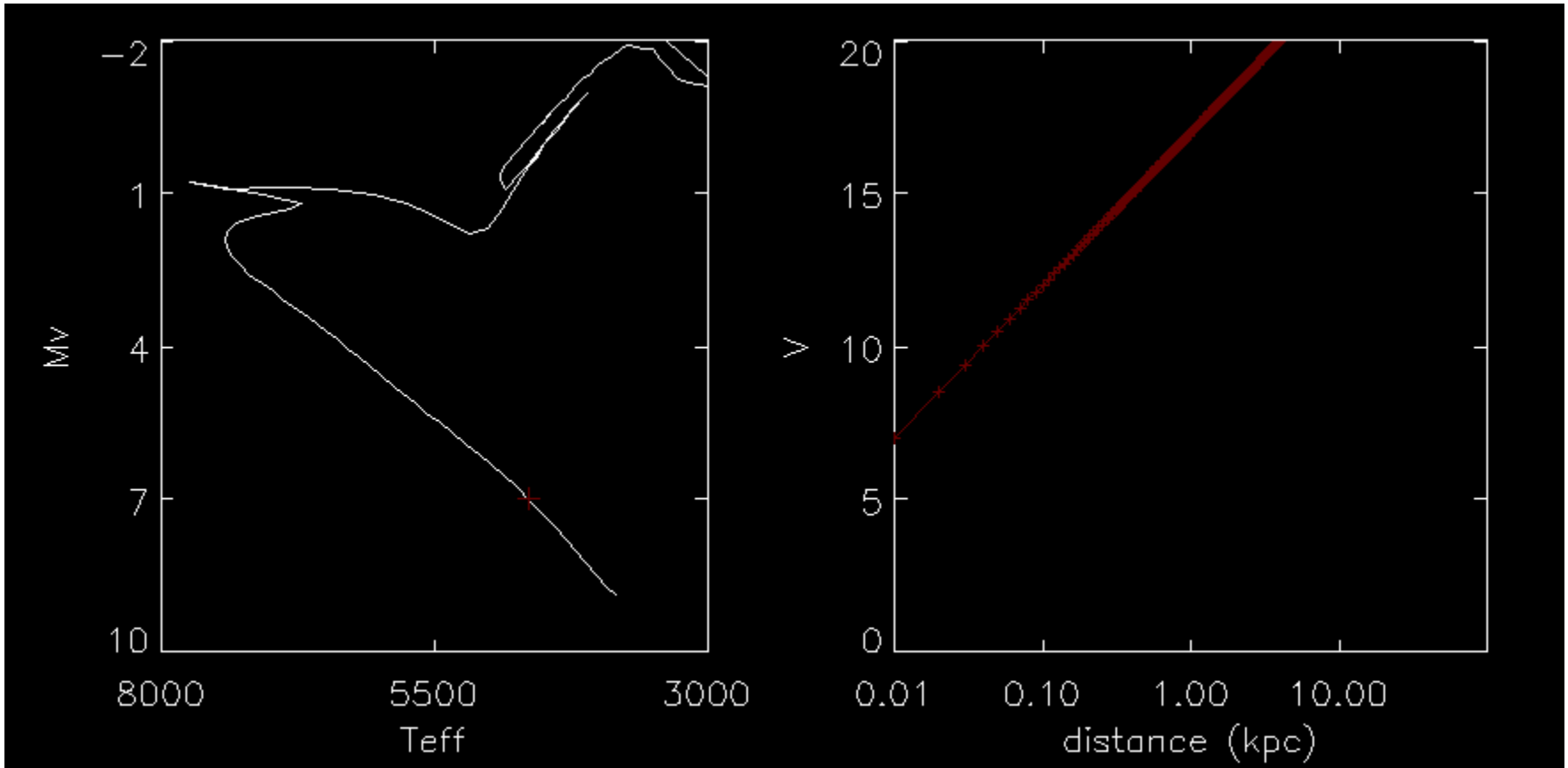
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Canarias

FOMBS: sample

- CASE spectrograph: 365-950 nm, $R \sim 3500$, 450 fibers (5-8 arcseconds in diameter)
- Bright stars ($V < 12$), about 1 million on the Northern half of the sky
- High signal-to-noise ratio (S/N:50-100), accurate spectrophotometry, 45 min exposures
- To use the bright time over 3 years (~ 300 nights)

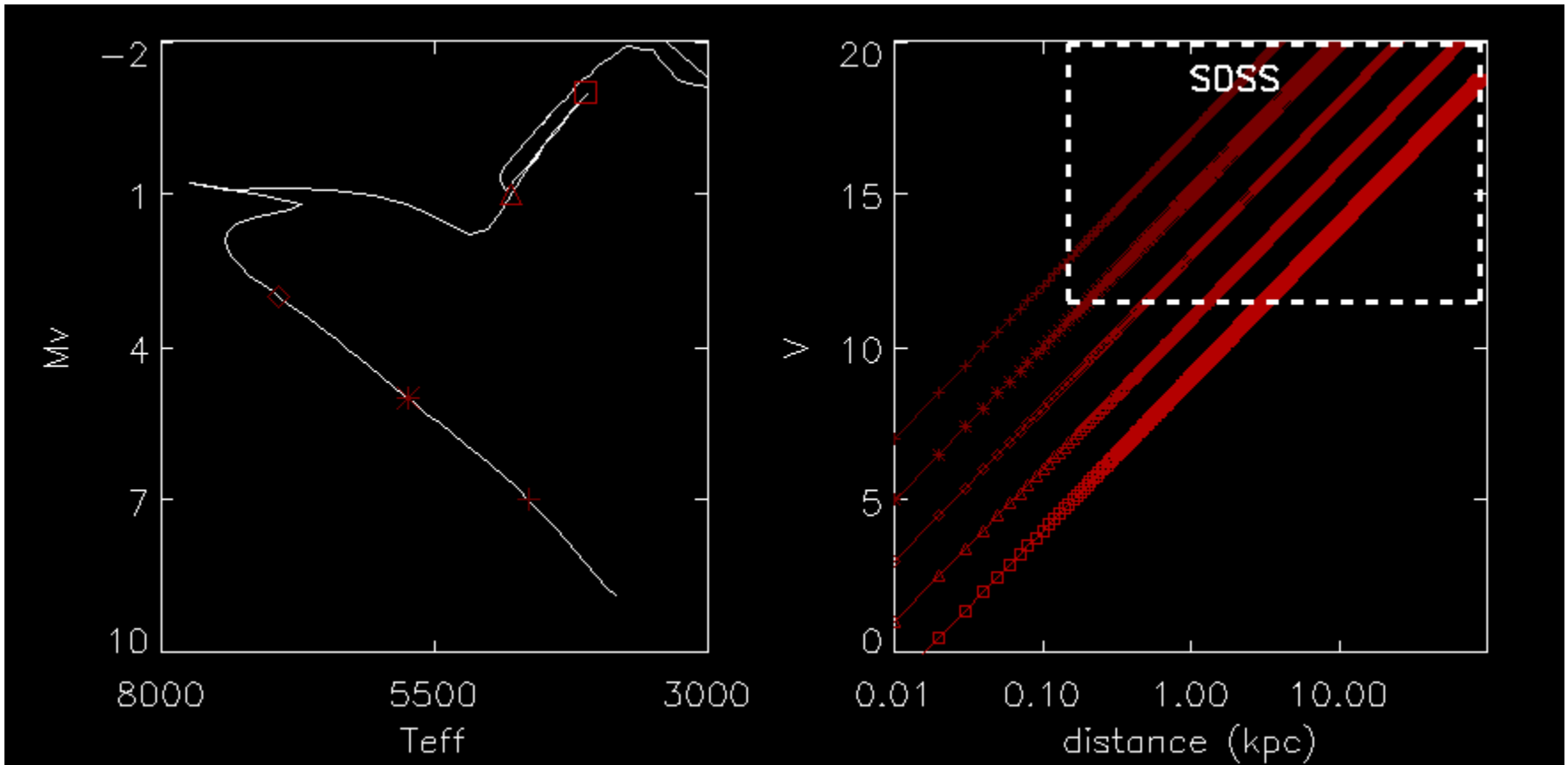
FOMBS: what will sample?

- The LOCAL stellar populations



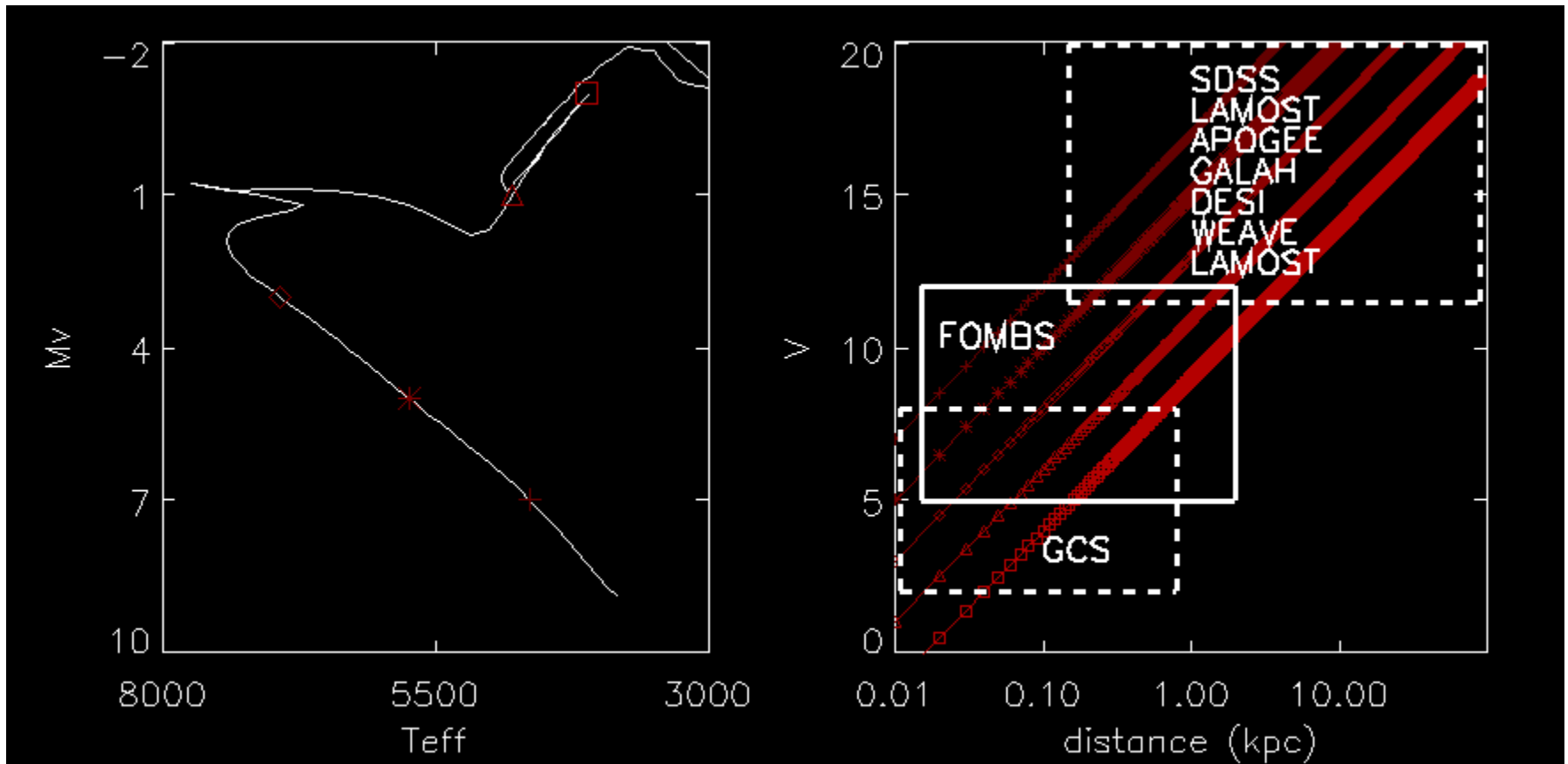
FOMBS: what will sample?

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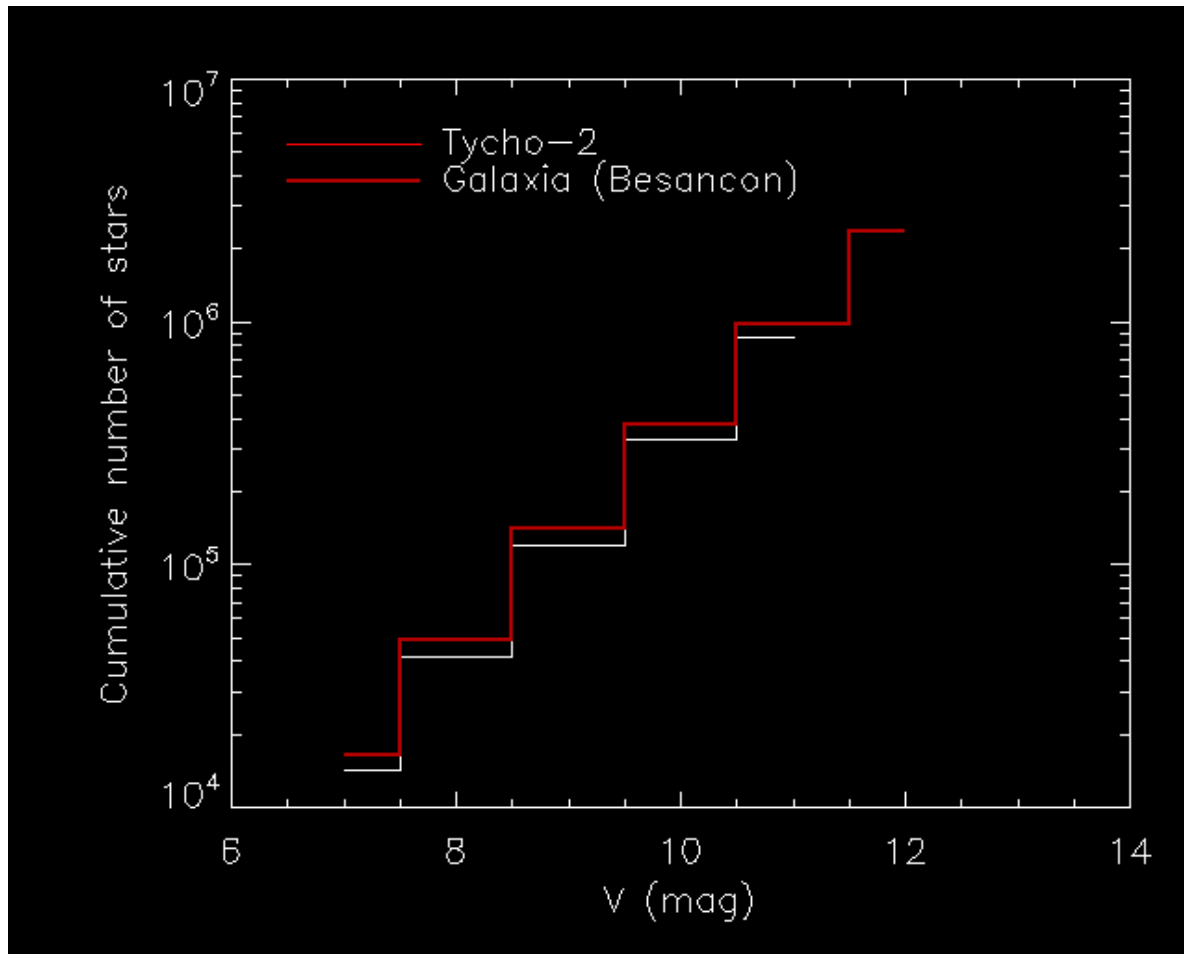


FOMBS: what will sample?

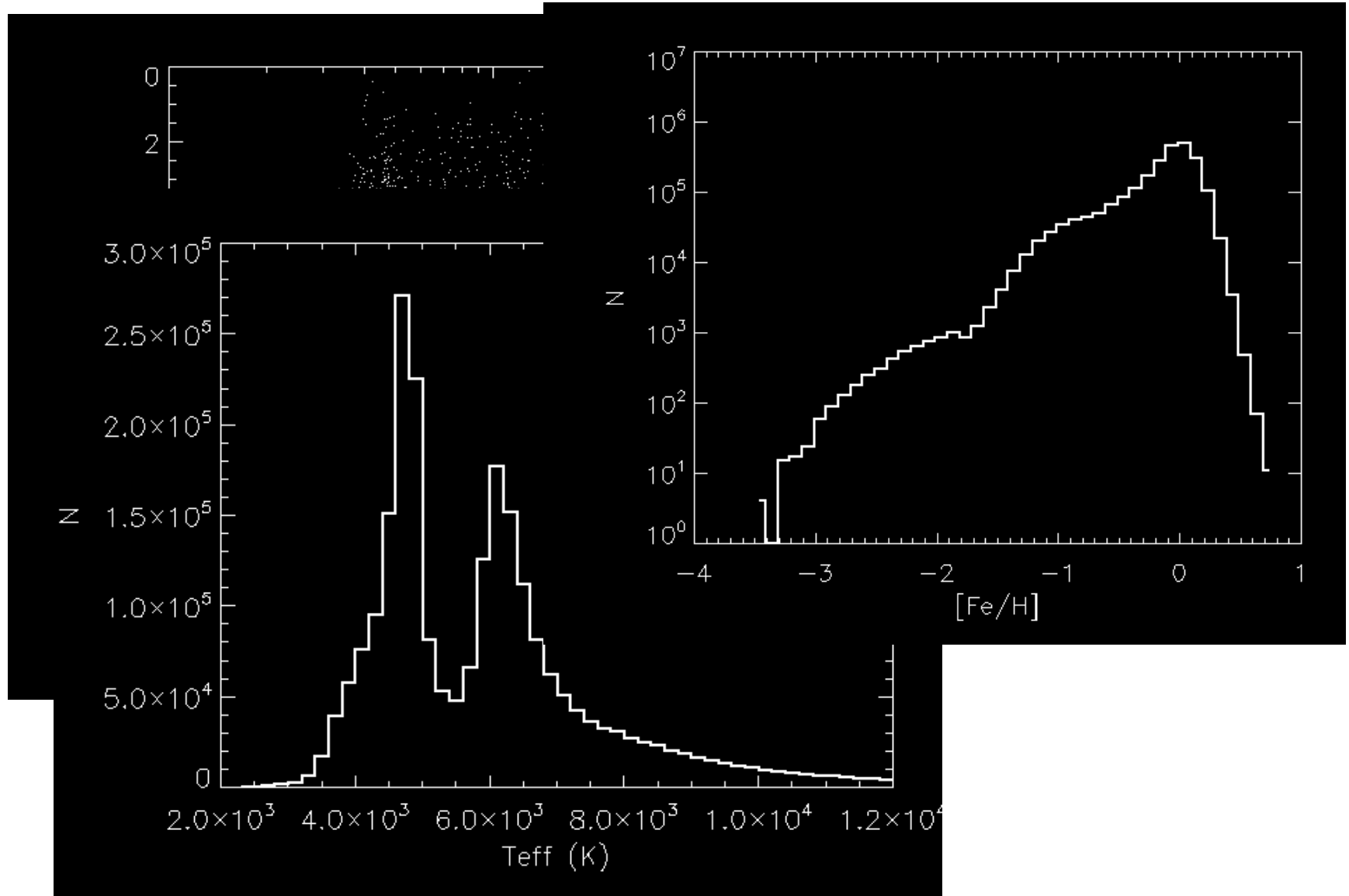
- The LOCAL stellar populations



FOMBS: basically Tycho-2



FOMBS: galaxia predictions



FOMBS: expanding GCS

- GCS: 14,000 stars with accurate parallaxes from Hipparcos + RVs + Stromgren photometry (metallicities)
- In-depth study of the local stellar populations

The Geneva-Copenhagen survey of the Solar neighbourhood^{*,}**

Ages, metallicities, and kinematic properties of ~14 000 F and G dwarfs

B. Nordström^{1,4}, M. Mayor³, J. Andersen^{2,5}, J. Holmberg^{2,5}, F. Pont³, B. R. Jørgensen⁴, E. H. Olsen²,
S. Udry³, and N. Mowlavi³

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² Astronomical Observatory, NBIfAFG, Juliane Maries Vej 30, 2100 Copenhagen, Denmark

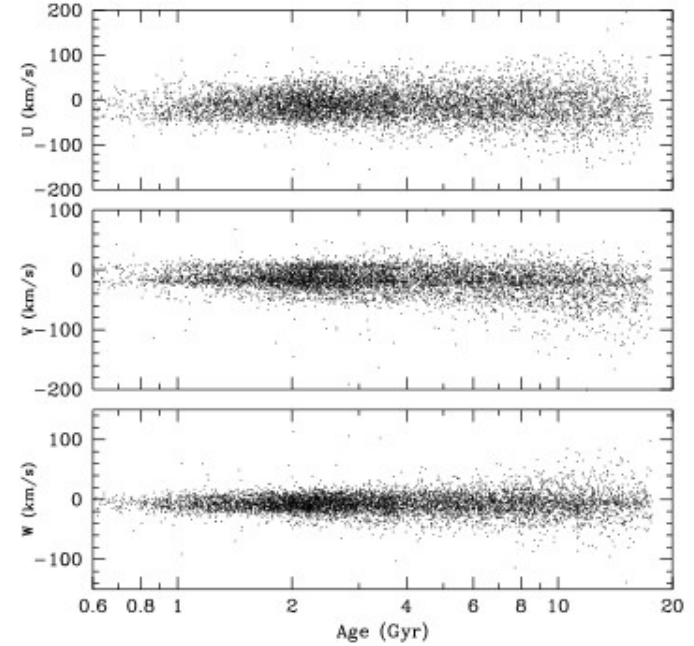
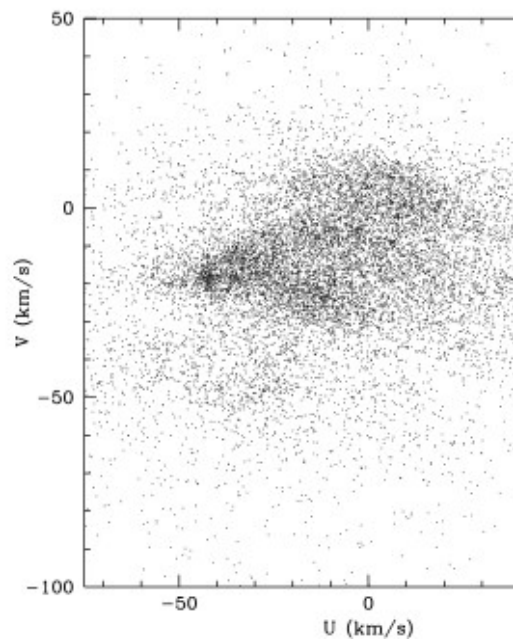
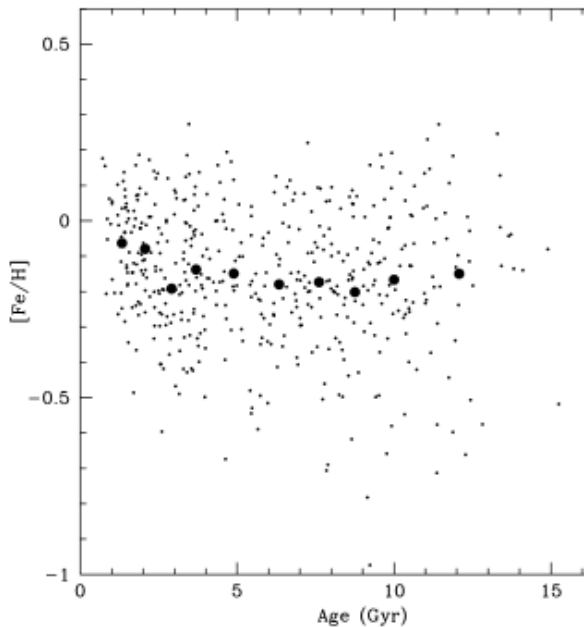
³ Observatoire de Genève, 51 Ch. des Maillettes, 1290 Sauverny, Switzerland

⁴ Lund Observatory, Box 43, 22100 Lund, Sweden

⁵ Nordic Optical Telescope Scientific Association, Apartado 474, 38700 Santa Cruz de La Palma, Spain

GCS: *our* 100 pc bubble

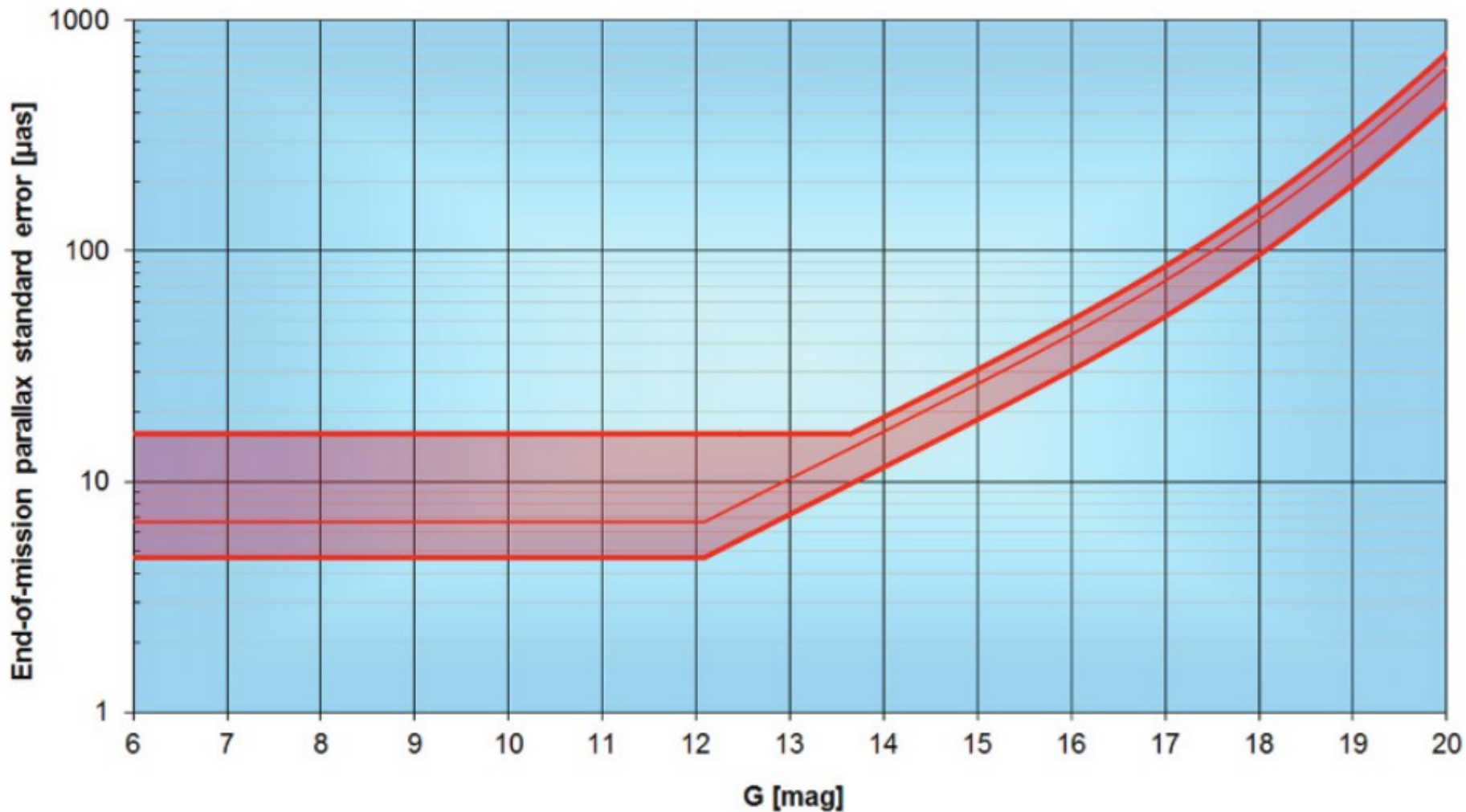
- Age-metallicity relationship, metallicity distributions
- Velocity structure
- Velocity dispersion vs. age



FOMBS vs. GCS

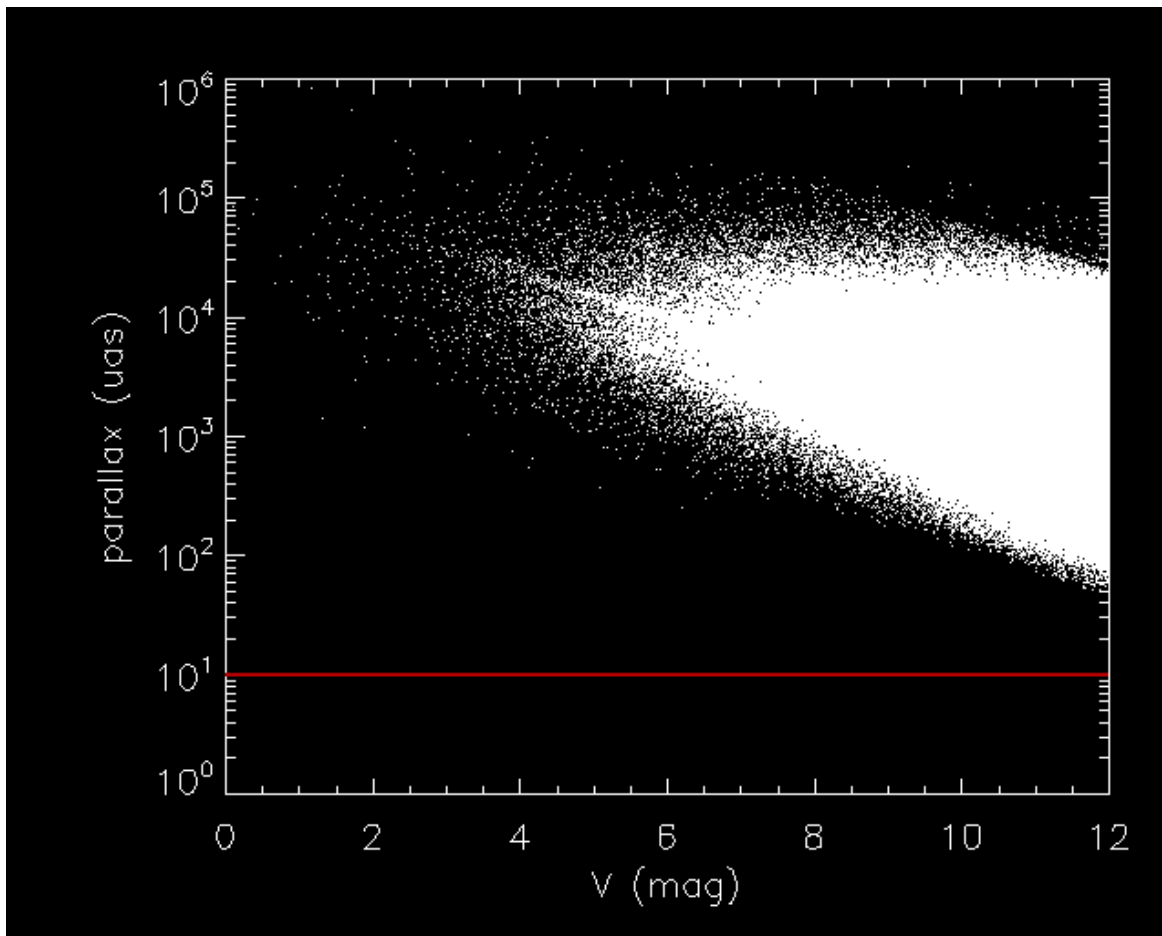
- 10% parallaxes -> 0.1% parallaxes at 100 pc
- 14,000 stars -> 1,000,000 stars
- [Fe/H] from Stromgren photometry -> [Fe/H] from spectra (and T_{eff} and $\log g$ from spectrophotometry, thanks to wide fibers!)
- More accurate AGES, KINEMATICS

FOMBS vs. GCS



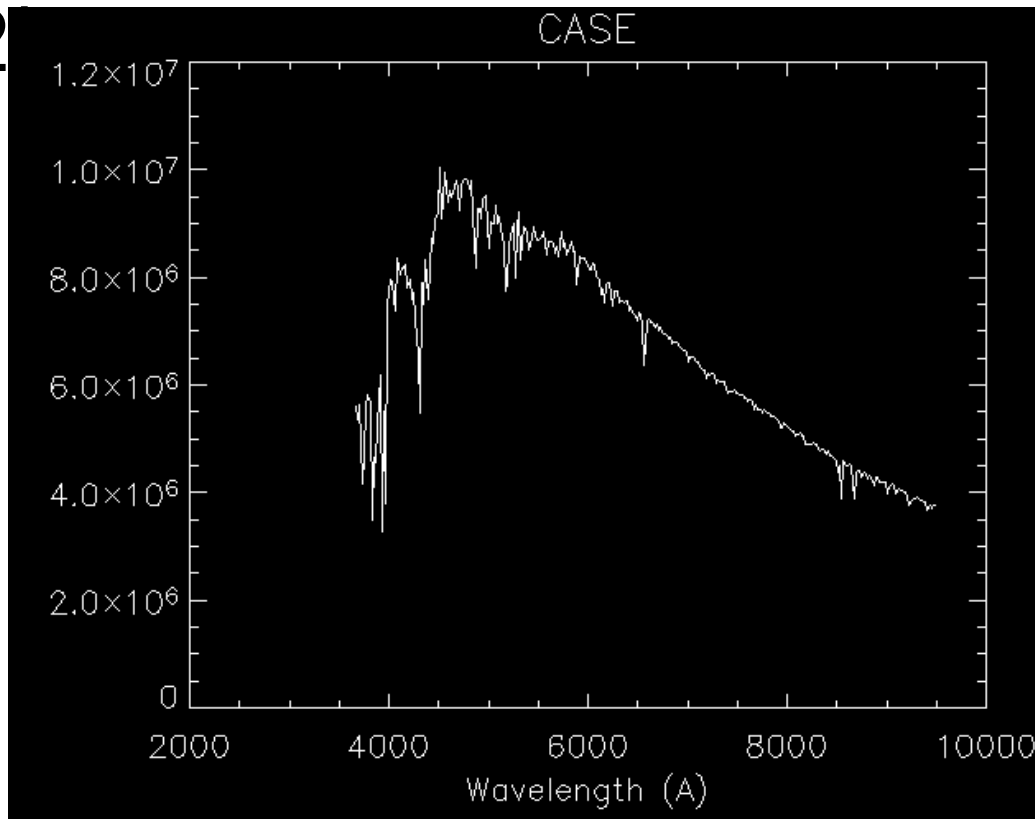
FOMBS vs. GCS

- 10% parallaxes \rightarrow 0.1% parallaxes at 100



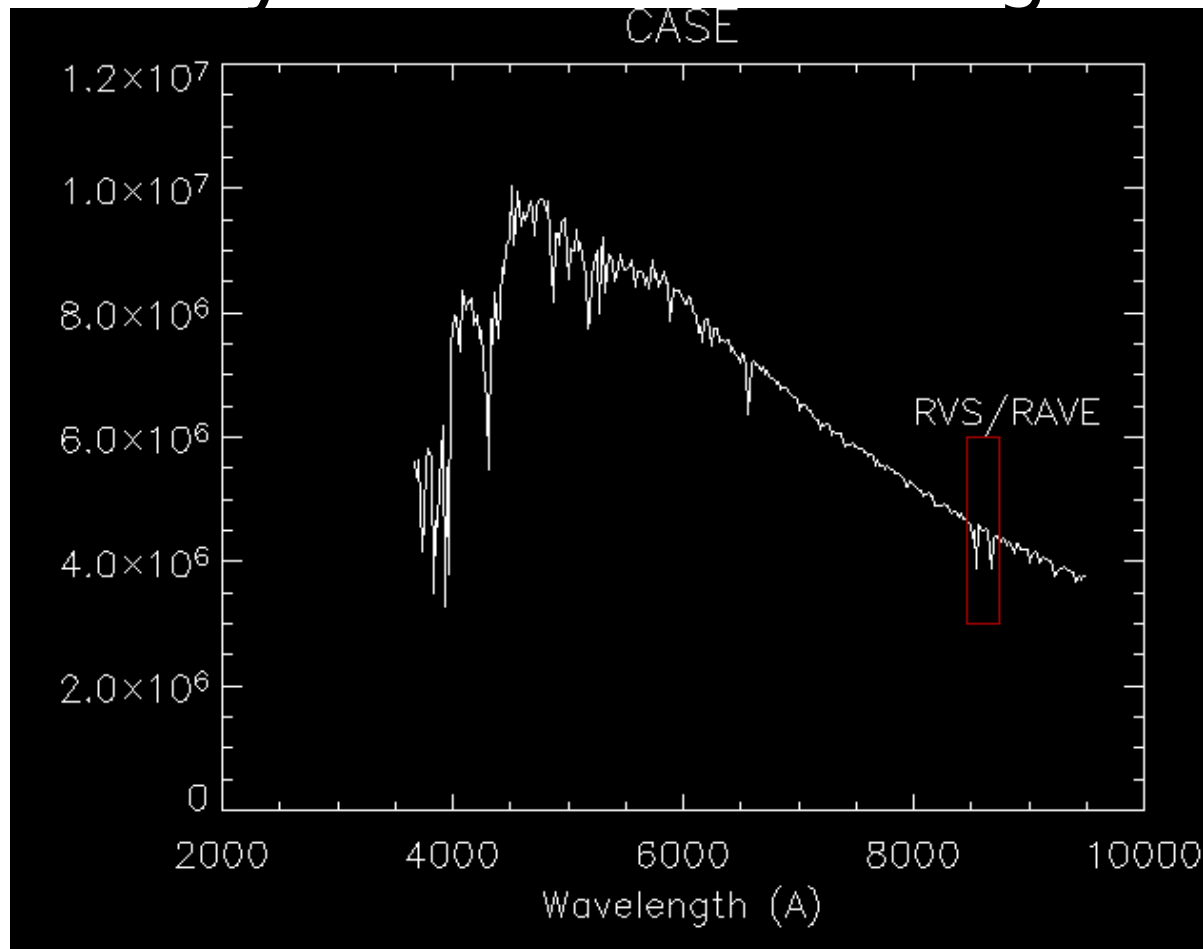
FOMBS, RAVE and RVS

- The $V < 12$ sample overlaps with RAVE in magnitude range (but South!) and RVS ($S/N \sim 50$ at $V = 11$ or $S/N \sim 35$ at $V = 12$)

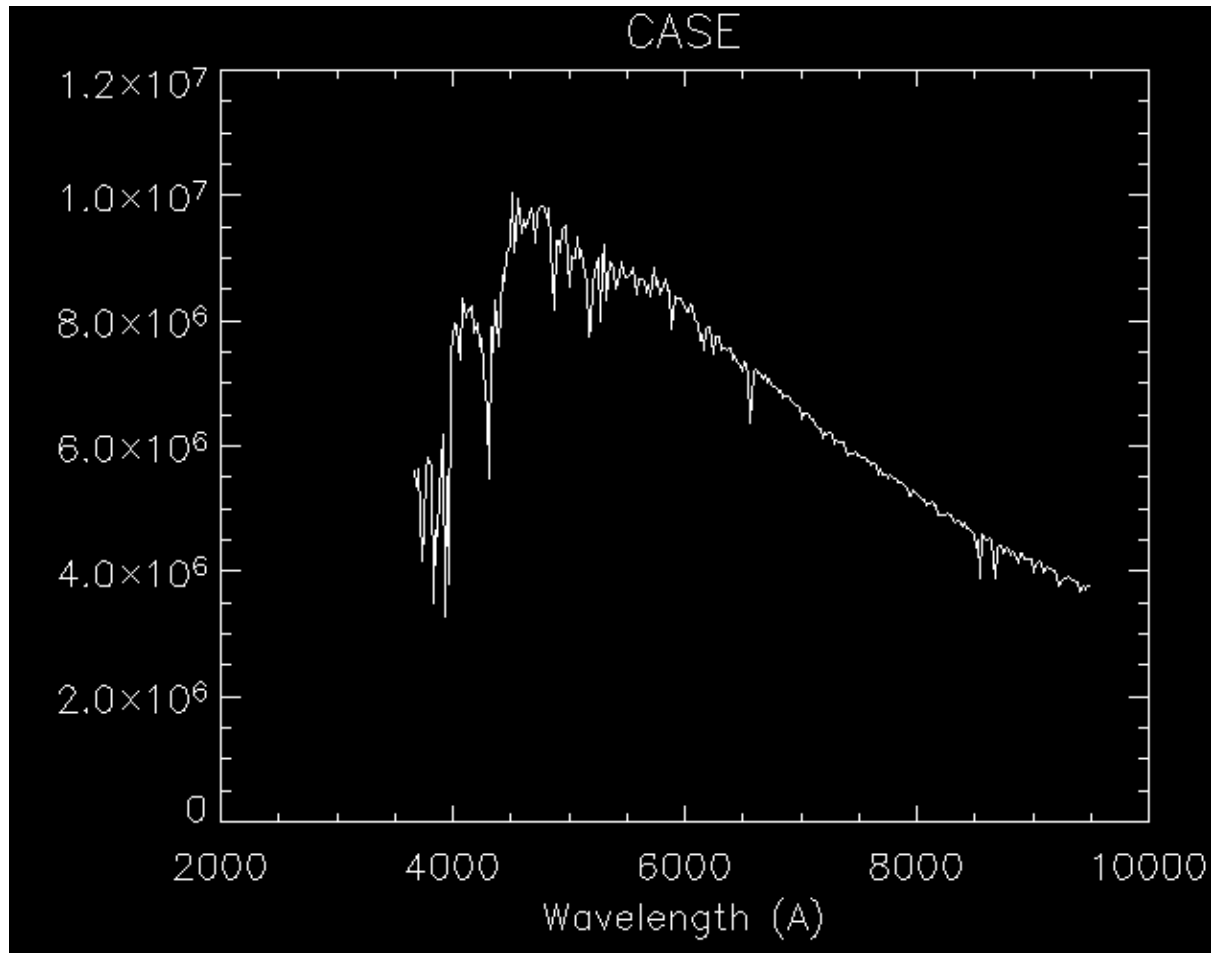


FOMBS, RAVE and RVS

- RAVE and RVS have higher resolution BUT a very limited wavelength range

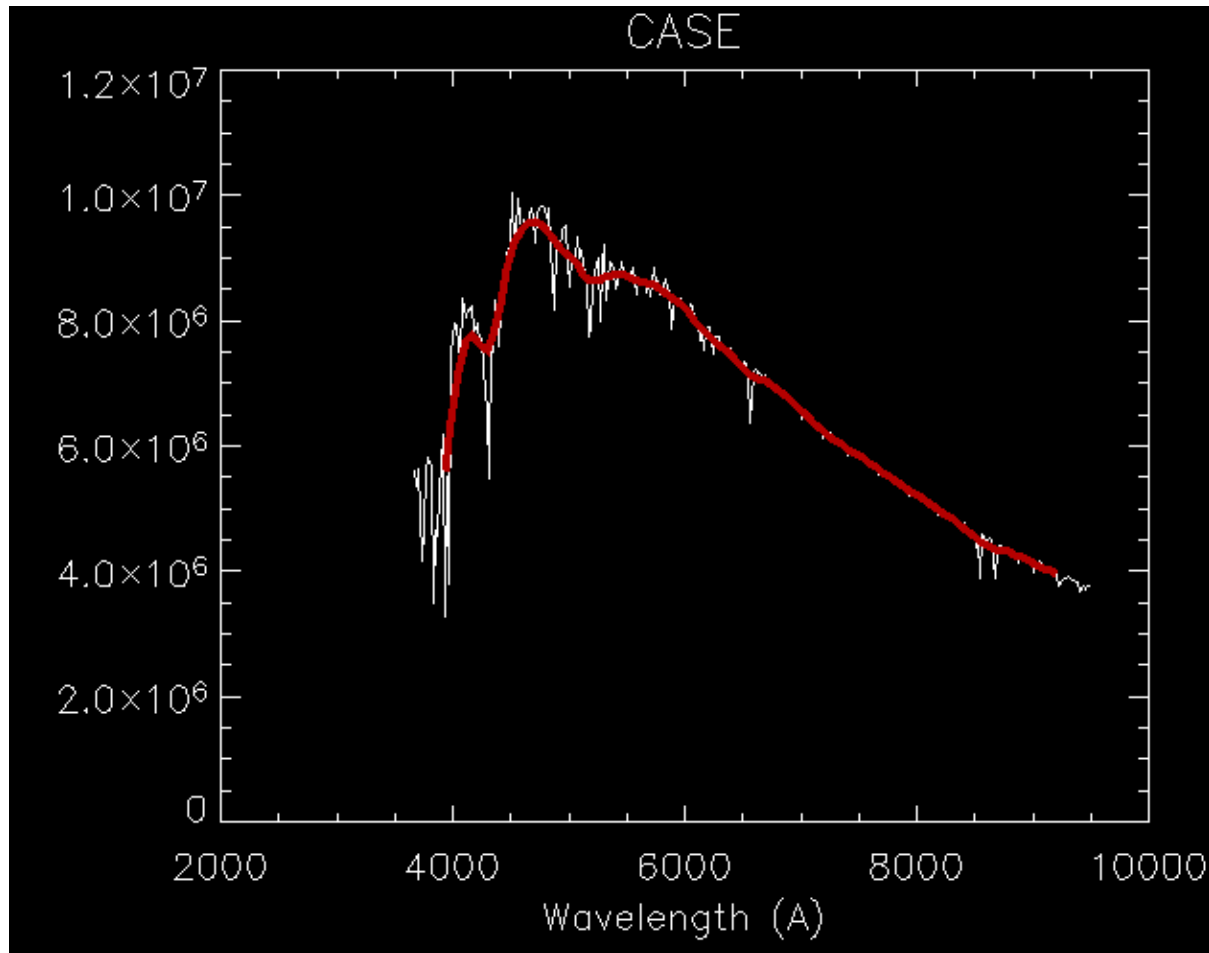


FOMBS and BP/RP



DOES RESOLVE LINES

FOMBS and BP/RP



DOES **NOT** RESOLVE LINES

FOMBS strengths

- Stars with independent, accurate, parameters from Gaia: $\log g$ from parallaxes, T_{eff} from spectrophotometry, R from angular diameters

provides CALIBRATION for FOMBS-like surveys of distant stars such as SDSS, LAMOST, DESI ...

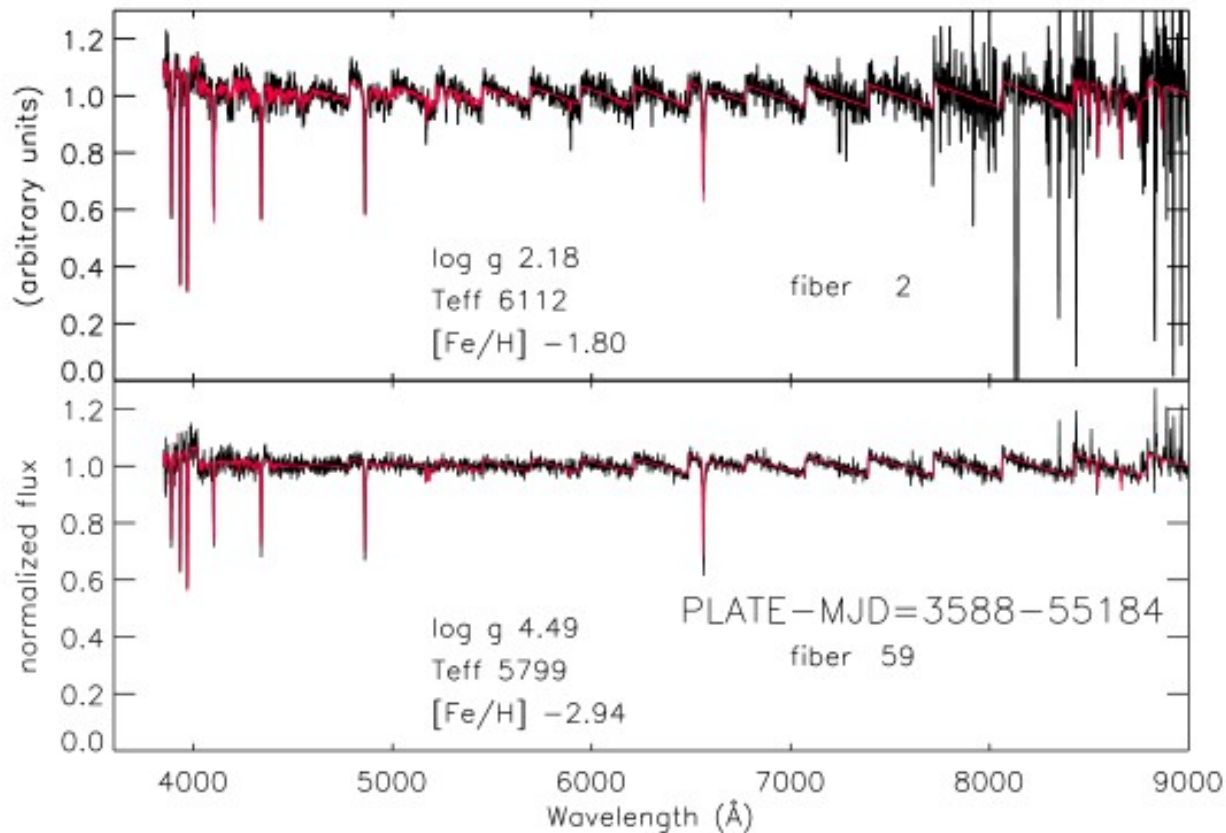
- FOMBS provides complementary information to RVG ...

In addition

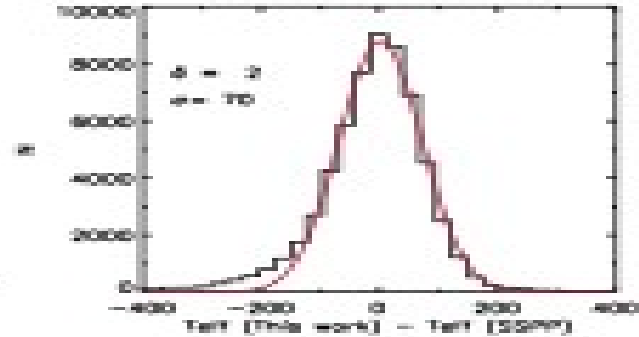
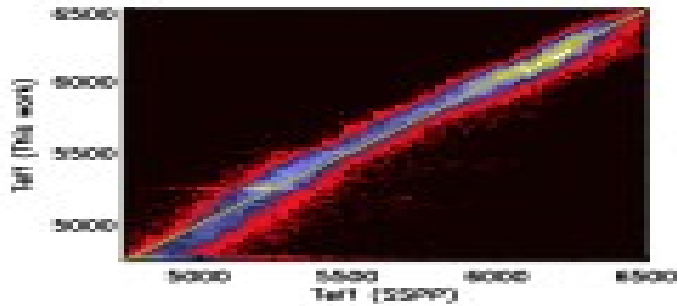
- Southern-hemisphere counterpart to FOMBS: funnel-web survey (TAIPAN)
- TESS will focus on bright stars, hence FOMBS can help to characterize their planet host stars and asteroseismic targets

How to analyze FOMBS stars?

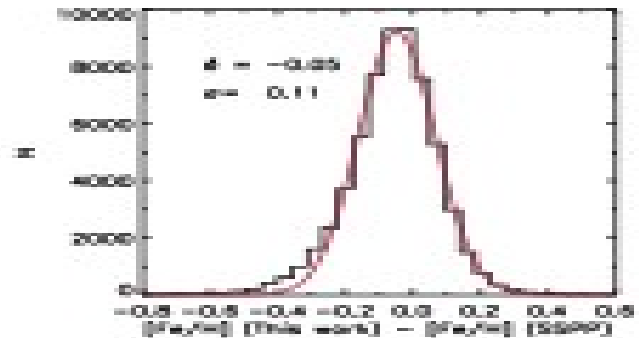
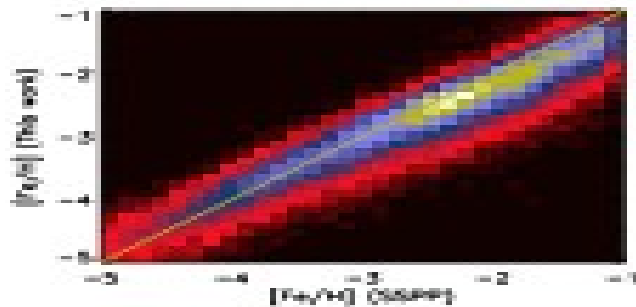
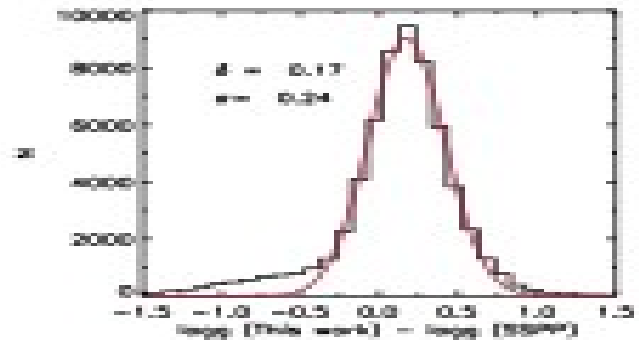
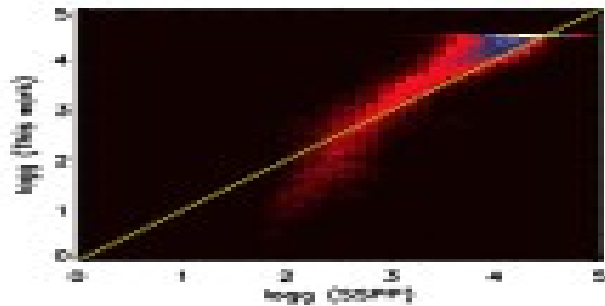
- Experience with SDSS extremely useful



How to analyze FOMBS stars?



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Summary

- FOMBS can complement Gaia data and expand the catalog of stars with exquisite fundamental parameters from 20,000 at 100 pc to 1,000,000 at 1 kpc
- This brings information on fundamental physics: stellar physics, galaxy/chemical evolution (disk formation)
- Also brings a bridge between the local stars and the more distant parts of the Galaxy observed with similar instruments (SDSS, Gaia-ESO, GALAH, APOGEE, DESI, WEAVE, LAMOST ...)

And a caveat

- The most exciting part is the **SINERGY** with Gaia
- If not in time, a lot of the science will still be done *without* FOMBS