

# STELLA



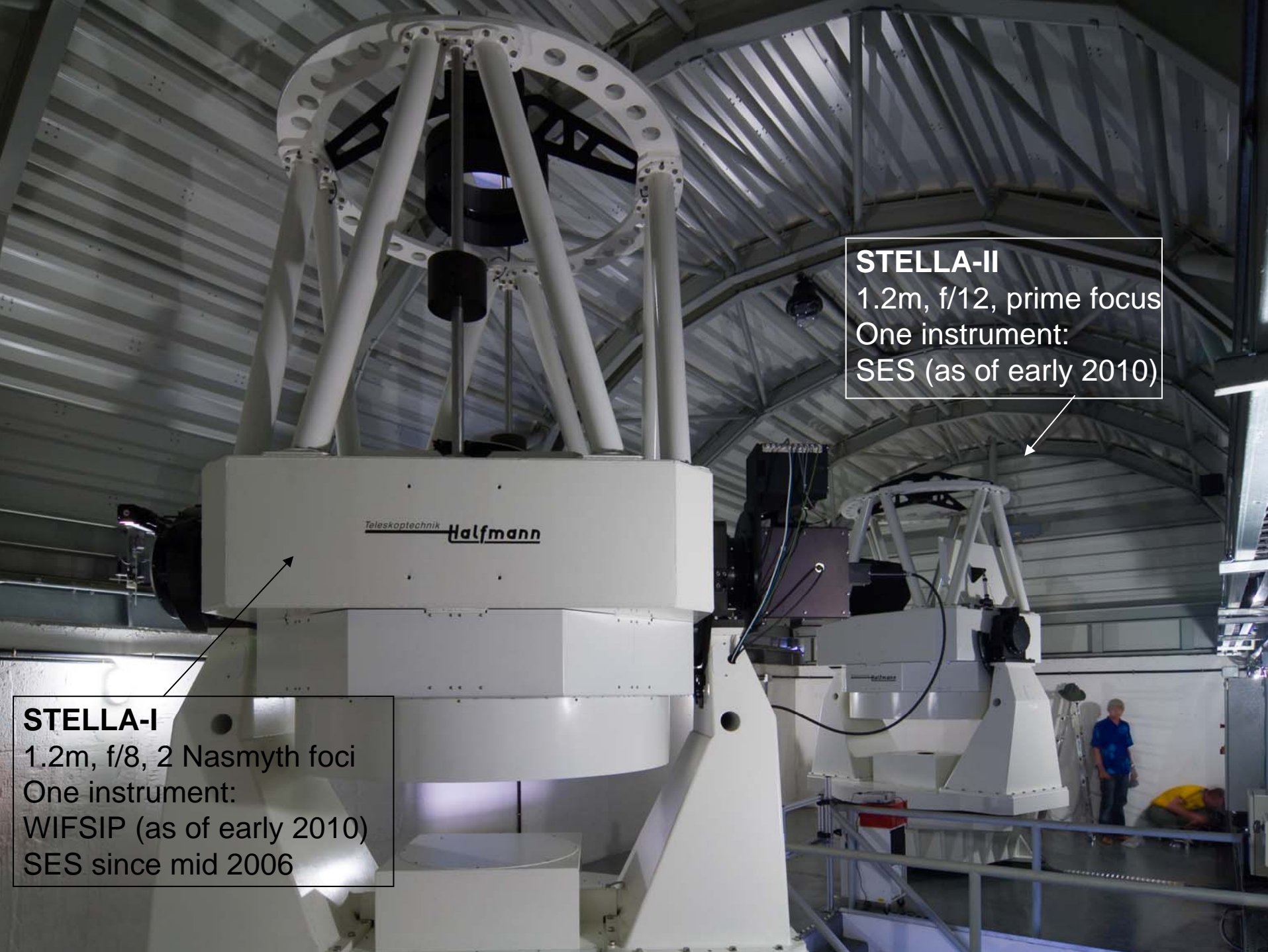
AIP



Two robotic 1.2m telescopes  
for Stellar Activity

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**STELLA-II**  
1.2m, f/12, prime focus  
One instrument:  
SES (as of early 2010)

**STELLA-I**  
1.2m, f/8, 2 Nasmyth foci  
One instrument:  
WIFSIP (as of early 2010)  
SES since mid 2006

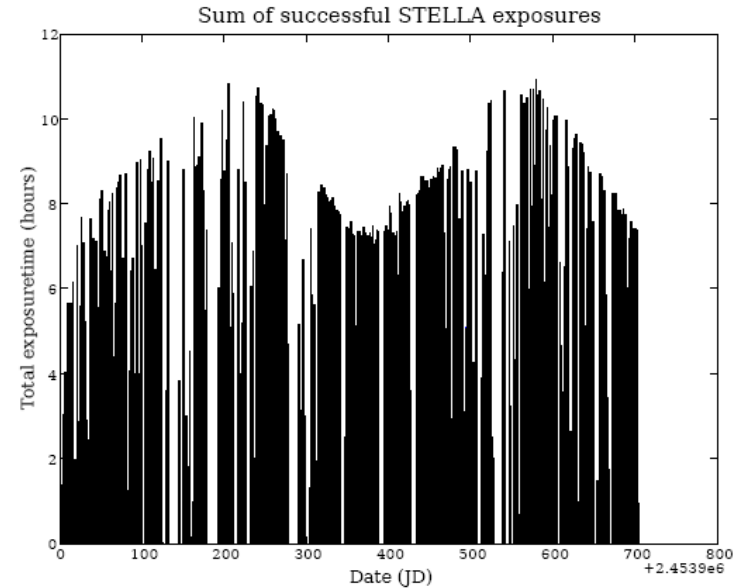
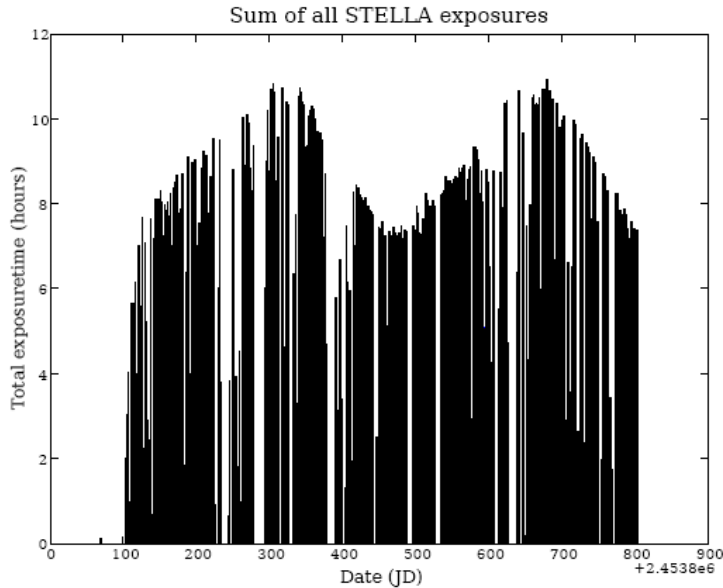
Teleskoptechnik **Halfmann**



**SES** first-light version:  $R=55,000$ , 390-870nm, E2V 2kx2k CCD.

# Peak shutter-open time = 93%

Total exposure time (hours)



700 nights

Figure 7. *Left:* The sum of all SES scientific exposure times per day. Nighttime calibration is not included, but targets lost during integration are. *Right:* Same as before, but only targets considered successful. This usually means that the specified integration time has been reached, but could also be a required minimum signal-to-noise ratio. The difference accumulates to approximately 5%.

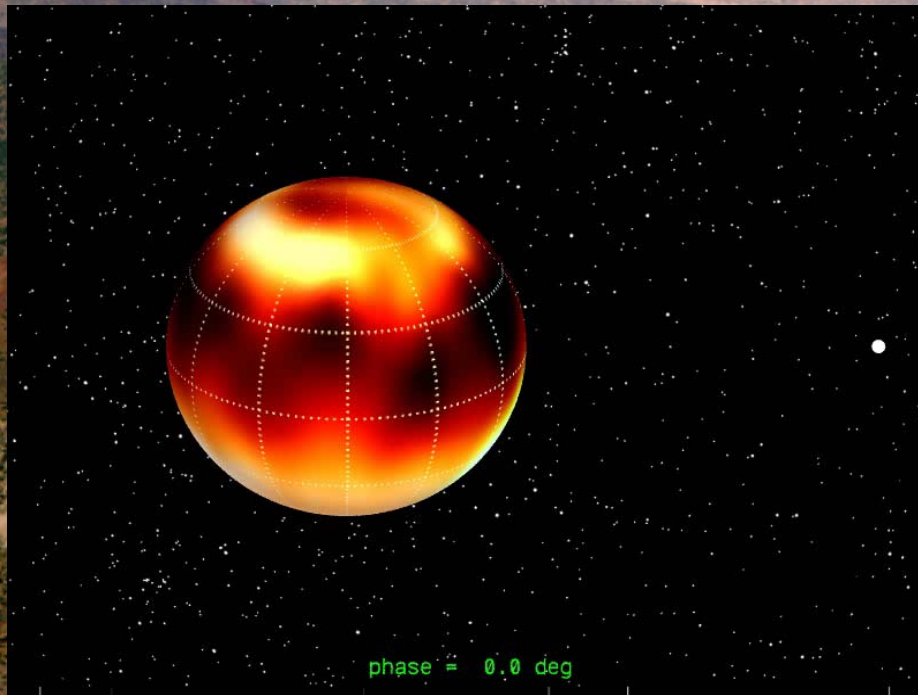
Weber, Granzer, Strassmeier & Woche 2008, SPIE 7019, 19

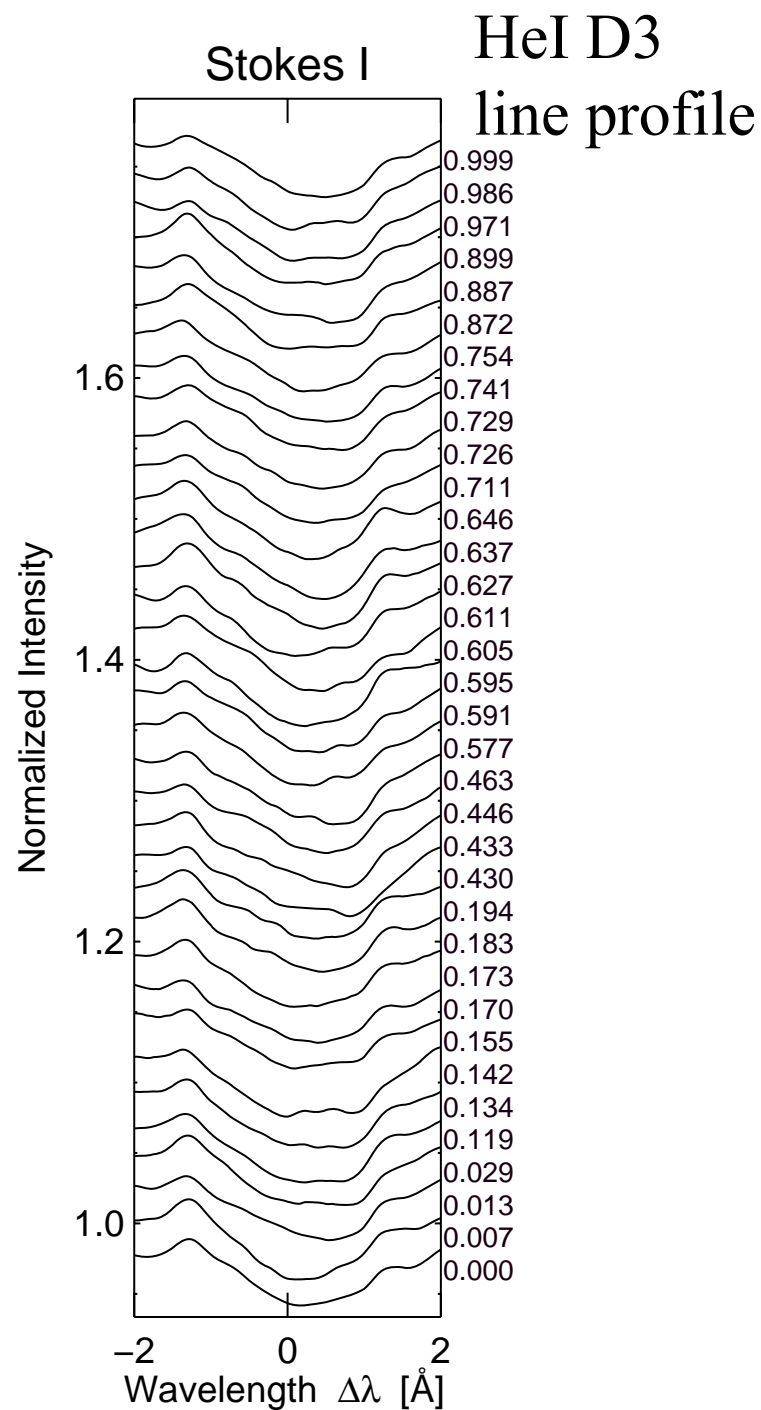
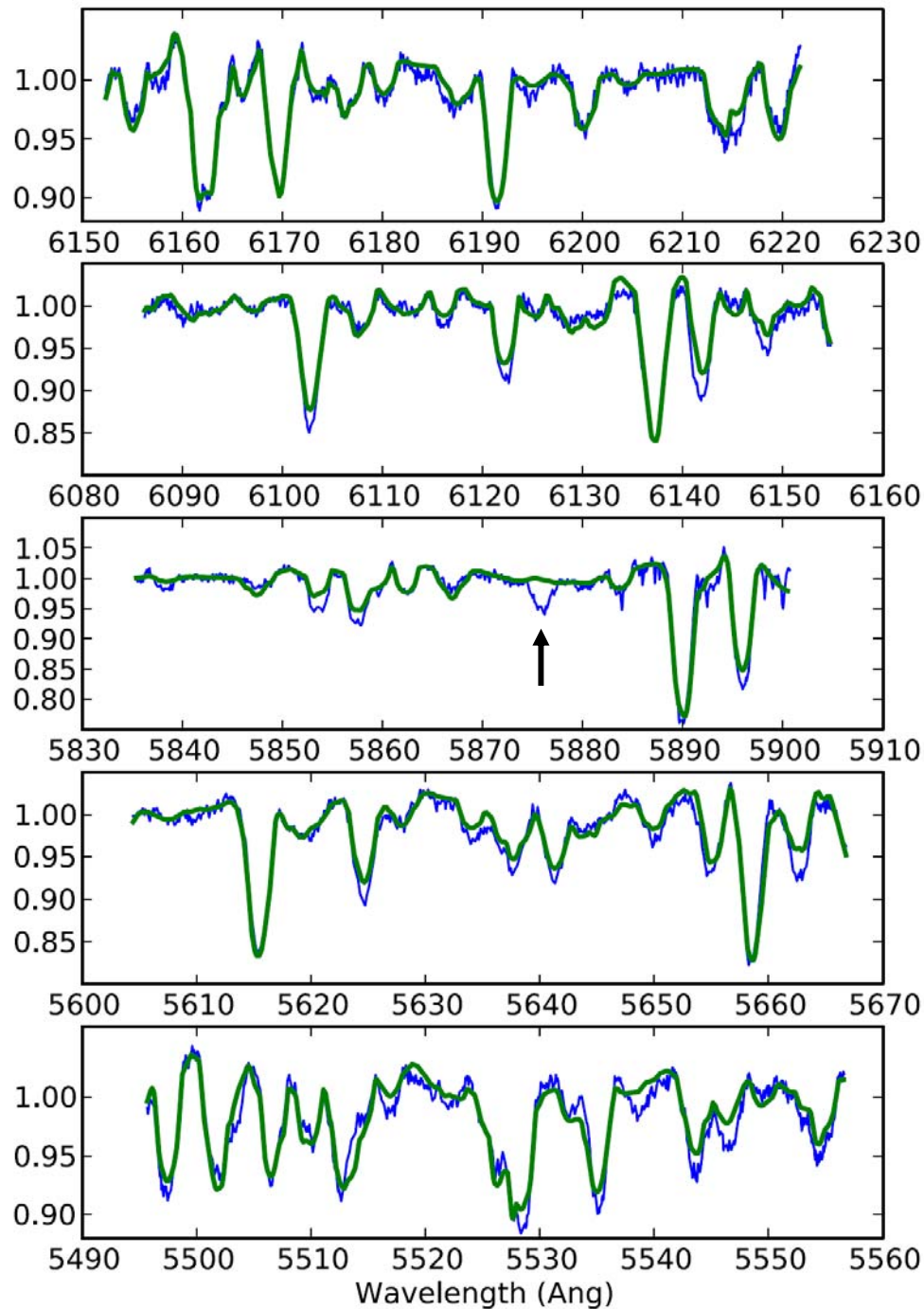
# Core-science



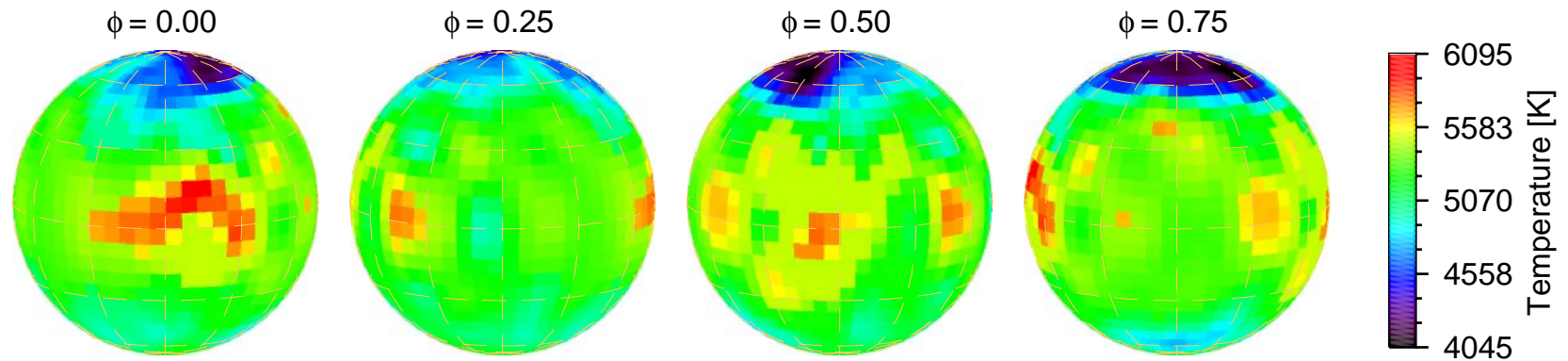
**SES** key-science project  
Time-series Doppler imaging of stellar  
surface structure (TSDI)

**WIFSIP** key-science project:  
„The STELLA Open Cluster Survey“  
The rotation evolution of low-mass stars  
(SOCS)





# The spots of 31 Comae (G0III)



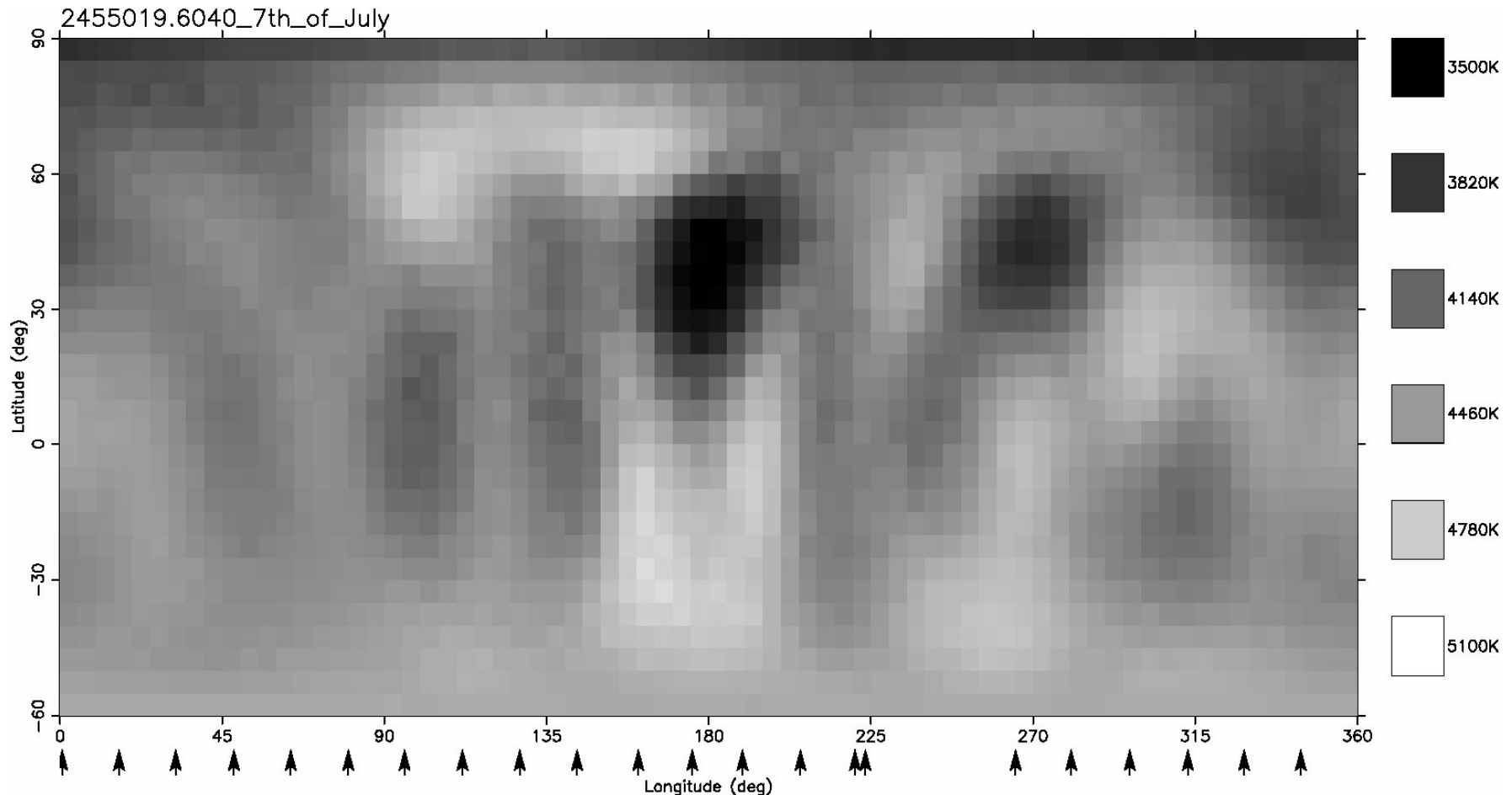
FeI5497 PCA 747 lines; Str. et al. 2010, A&A 520, A52

- **Cool polar spot** despite of the thin convective envelope (<20%).
- Few warm spots ( $\Delta T \approx 300-400\text{K}$ ) at low latitudes.
- Problem: flux tubes could not migrate to pole due to Coriolis force
- Alternative spot scenario: a mix of a fossil field and a just newly induced core-dynamo field.
- Would also explain activity despite 31 Com's large  $Ro = P(\text{rot})/\tau > 1$ .

## Polar spot possibly due to fossil field

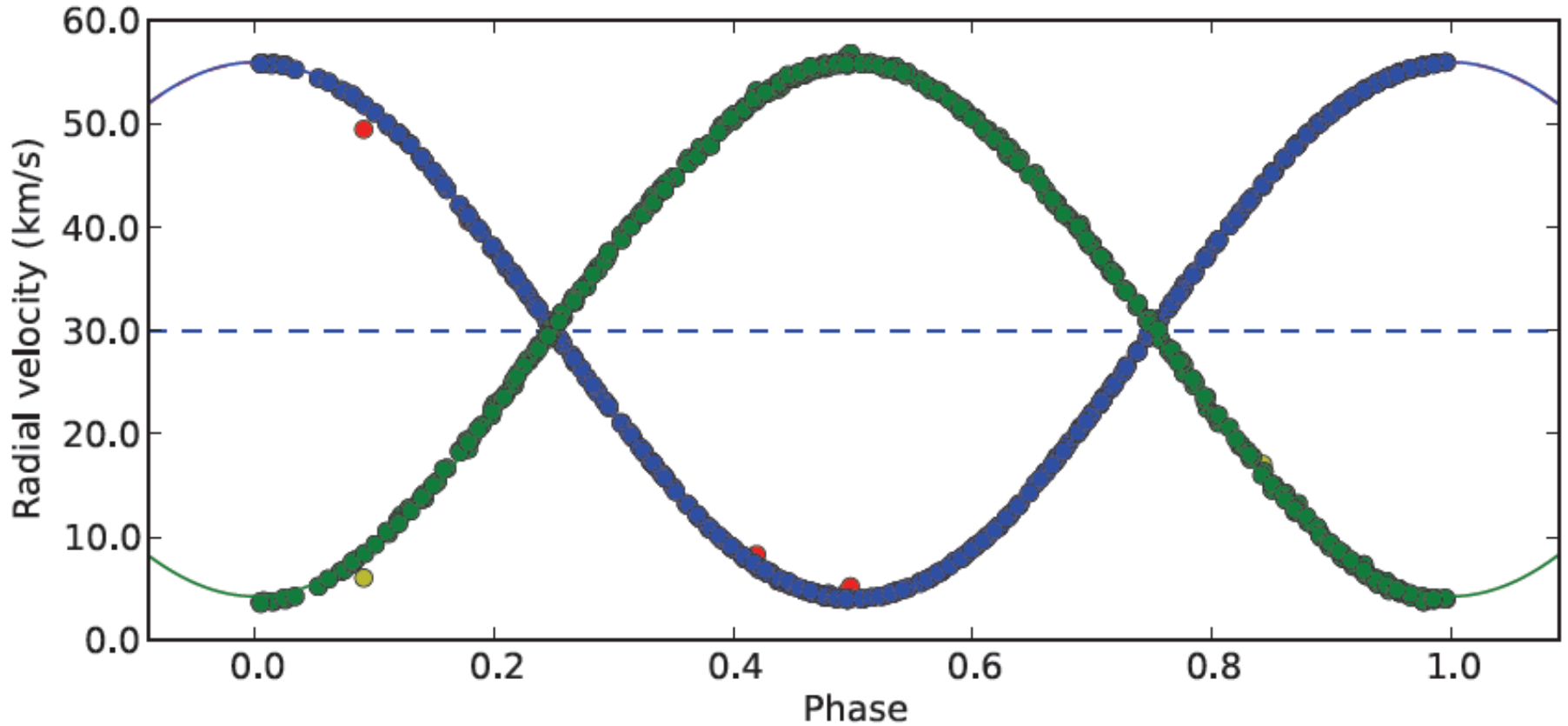
# First STELLA results: HD208472

- G8III SB1,  $P(\text{orb})=22.6$  d,  $P(\text{rot})=22.4$  d
- Below: DI maps from July 7 to August 30, 2009





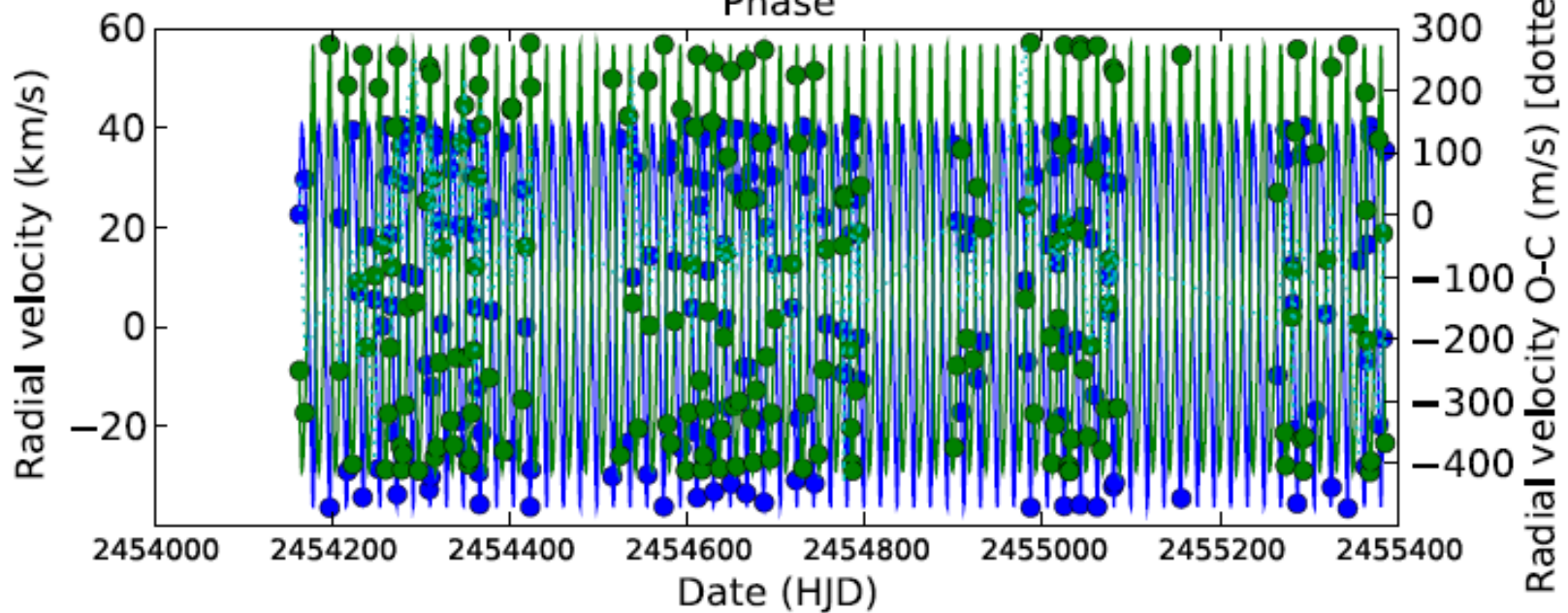
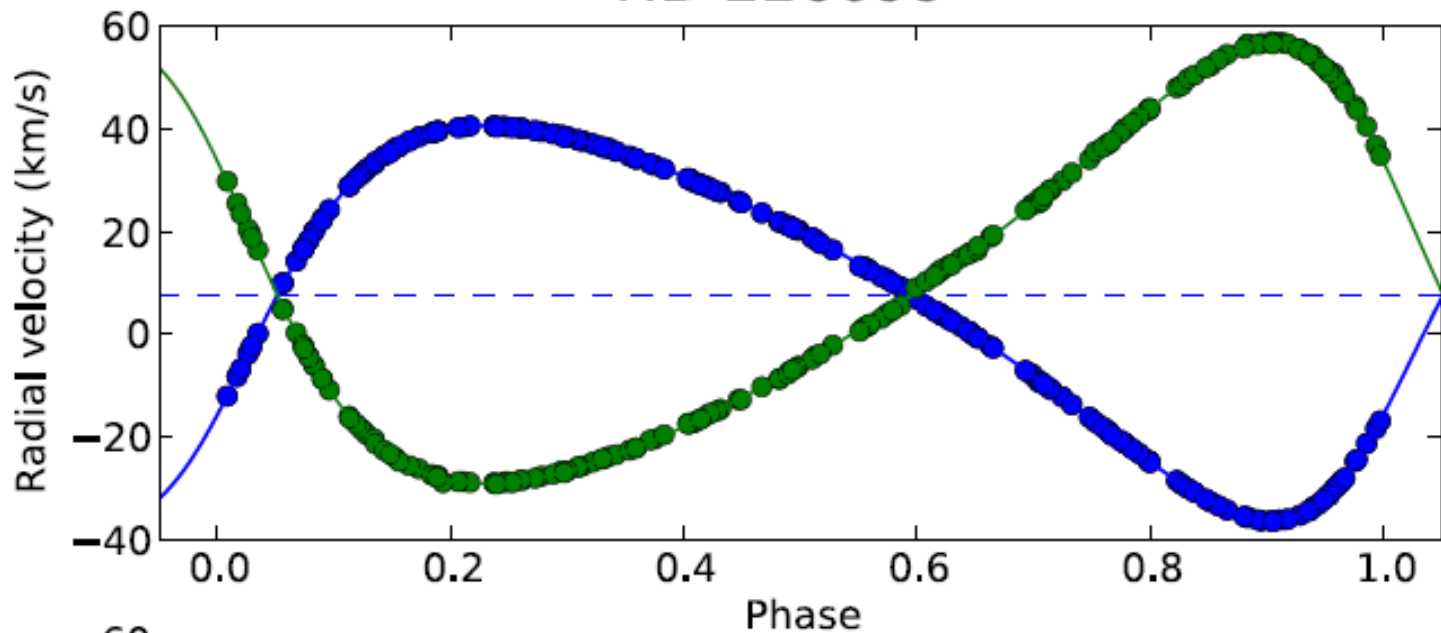
# Capella G0III+G9III



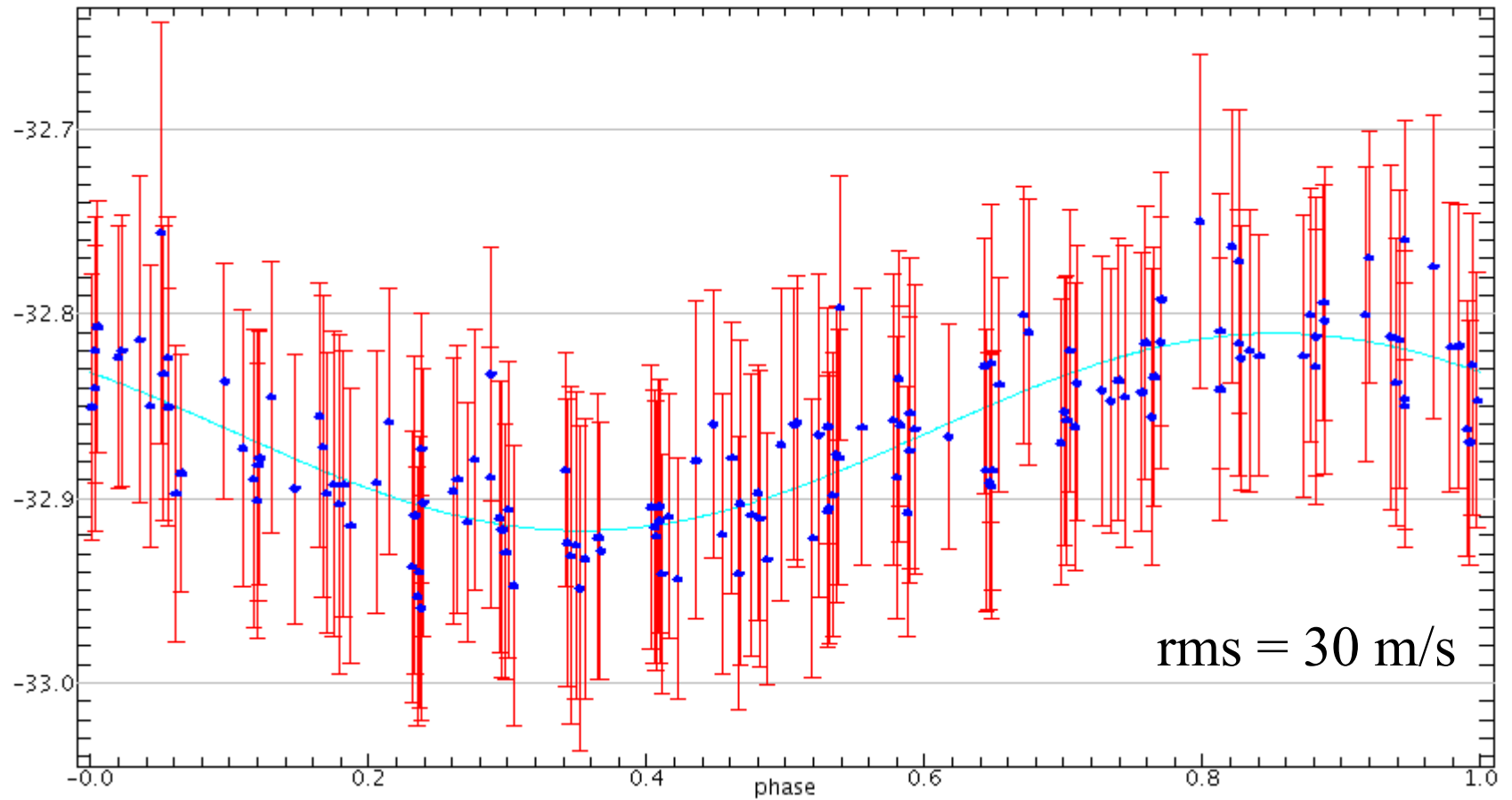
rms = 90 m/s

(Giant)Masses now good to 0.1% !

# HD 226099



# 51 Peg exoplanet

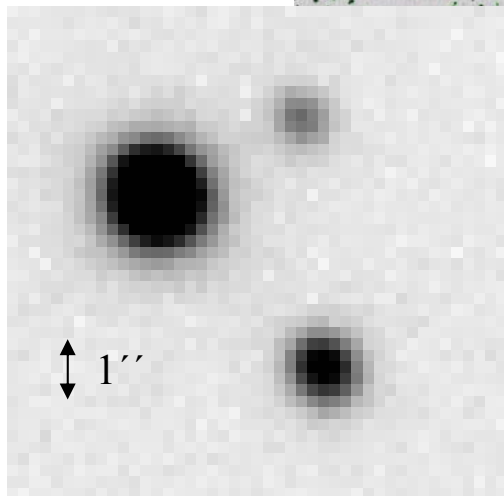
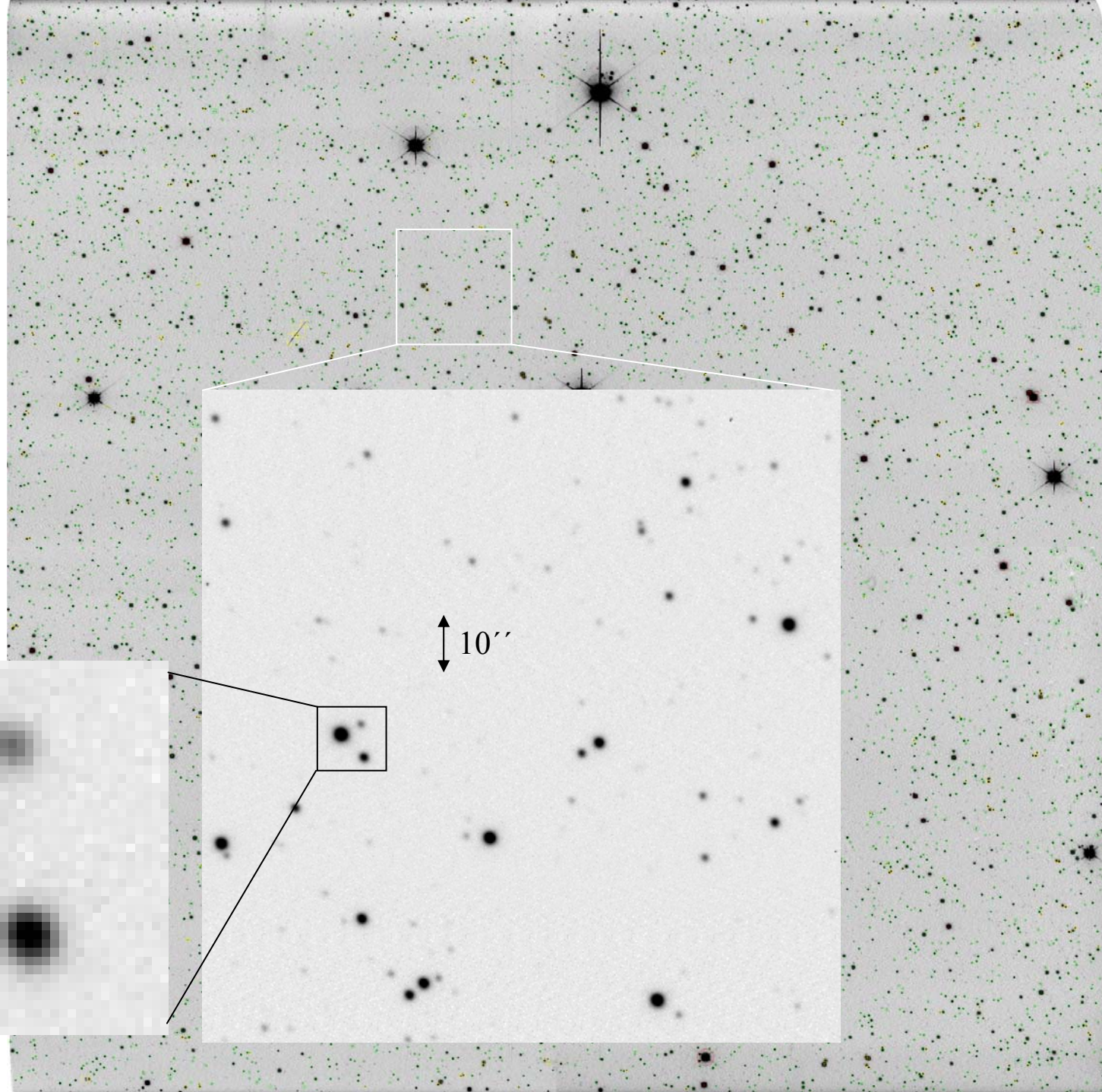




WiFSIP mounted  
Spring 2010

# NGC 7092

- 40 sec
- 1.3'' seeing
- 22'x22' FOV
- 7023 sources for photometry
- Obtained on 5.8.2010

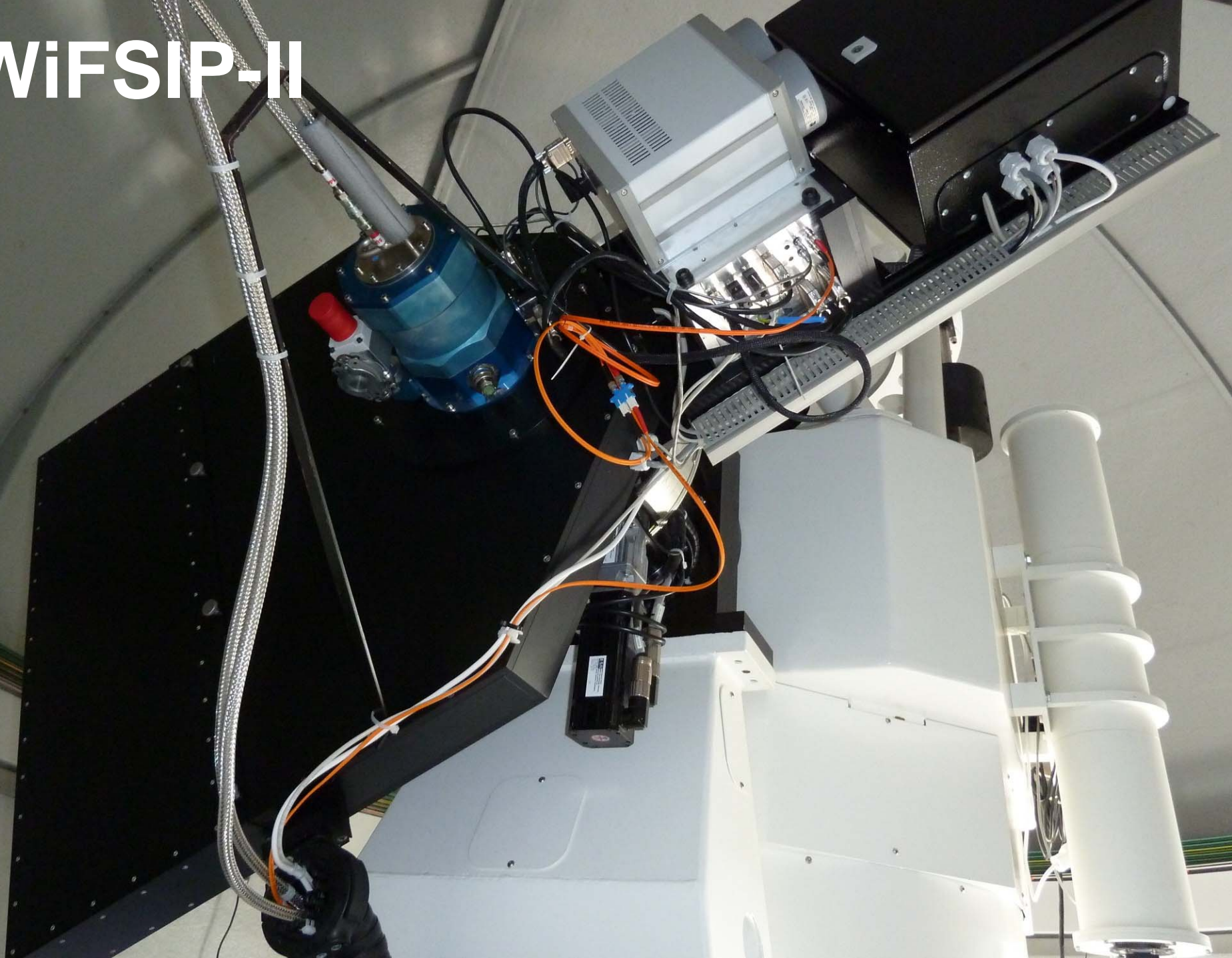


# RoboTel

The small STELLA sister telescope



# WiFSIP-II





# Summary

- **TSDI** ongoing. First results.
- **SES upgrade** underway (new fibers, CCD, controller, cross disperser, optical camera, dual-prism CD).
- SES moved to **STELLA-II**
- **WiFSIP** mounted and now operable at STELLA-I. **SOCS** started.
- **IR all-sky cloud monitor** installed and connected to SCS (no vis-band ops yet).
- Target lists etc. see: <http://www.aip.de/stella/>