



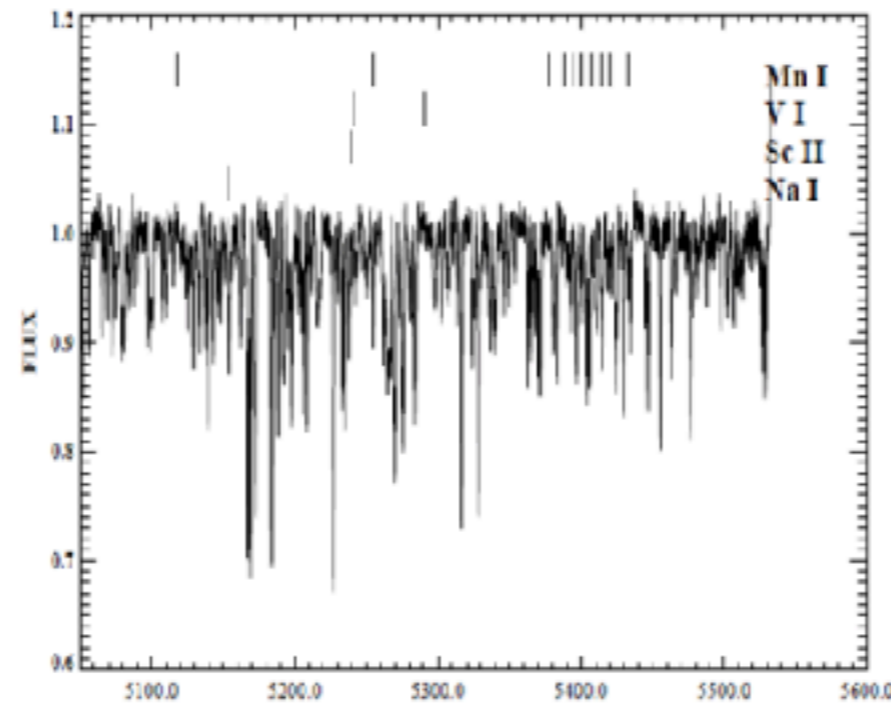
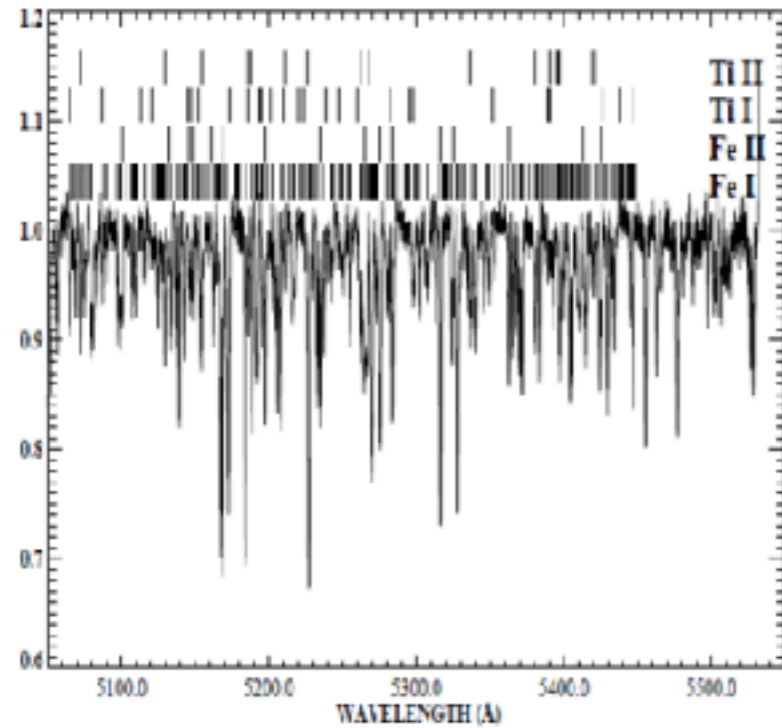
# LAMOST-II



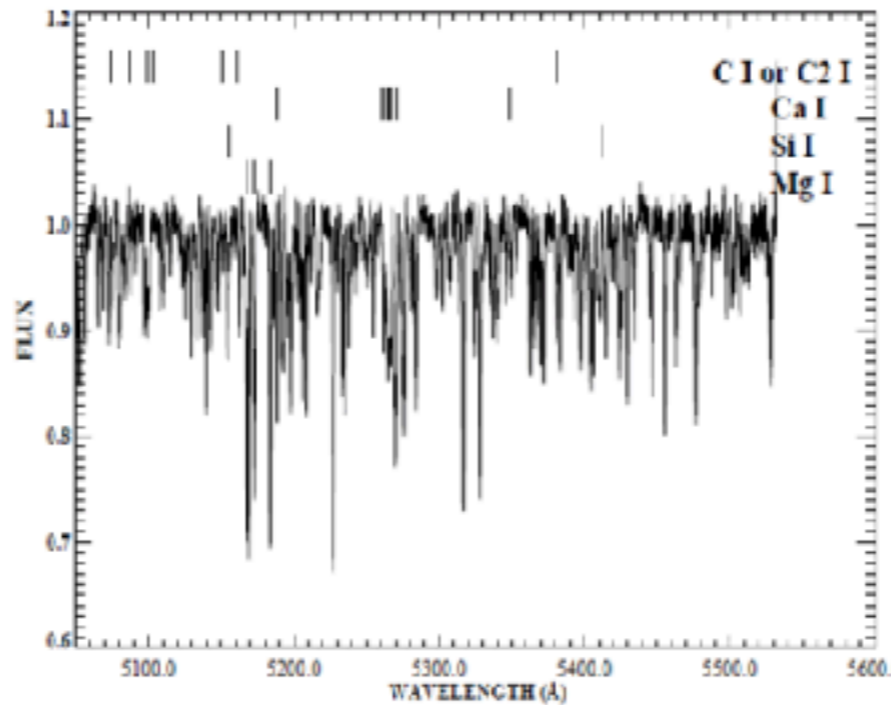
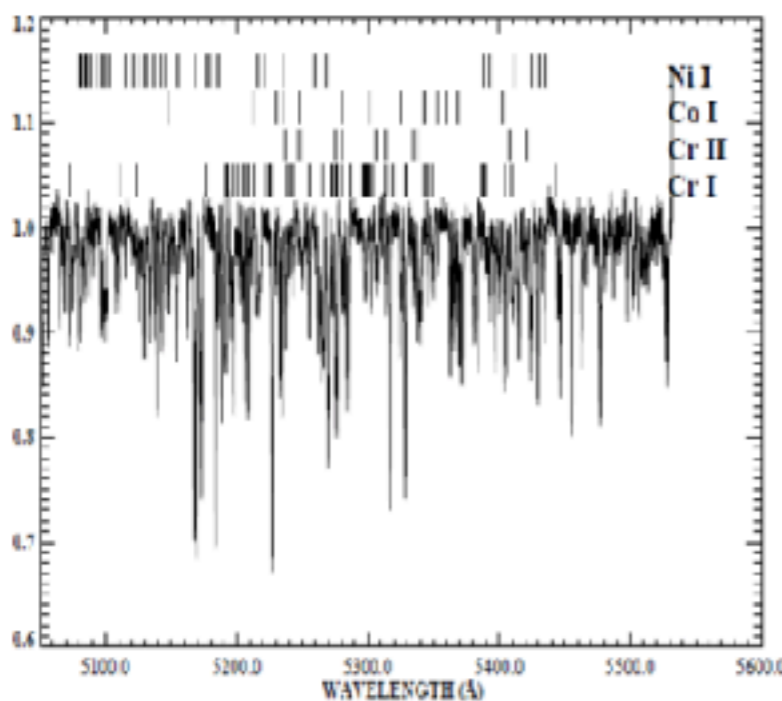
# Updated spectrographs

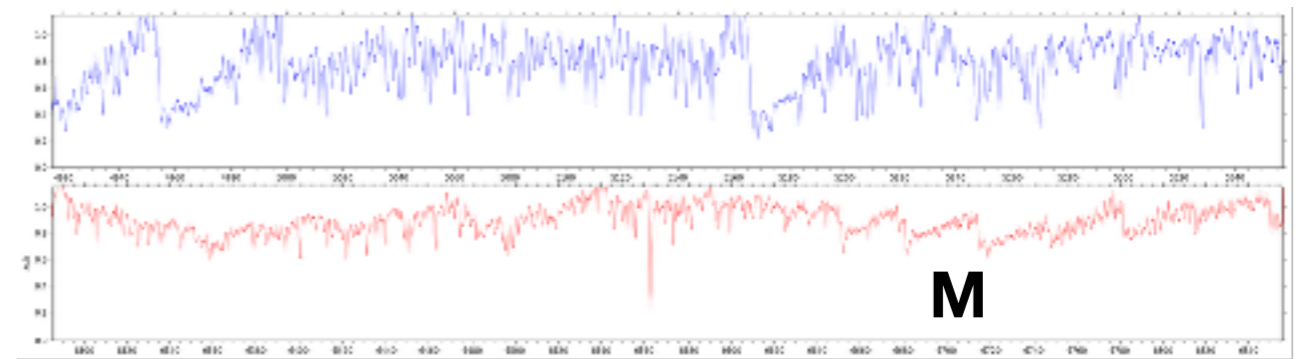
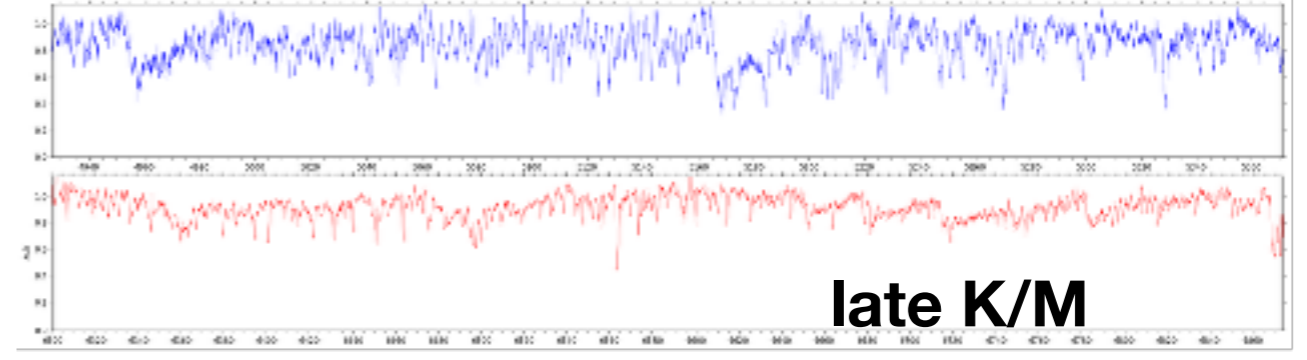
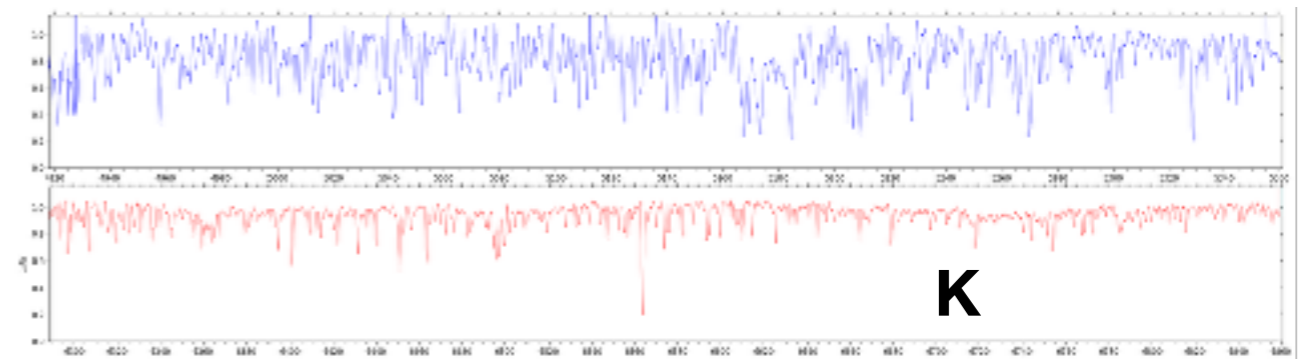
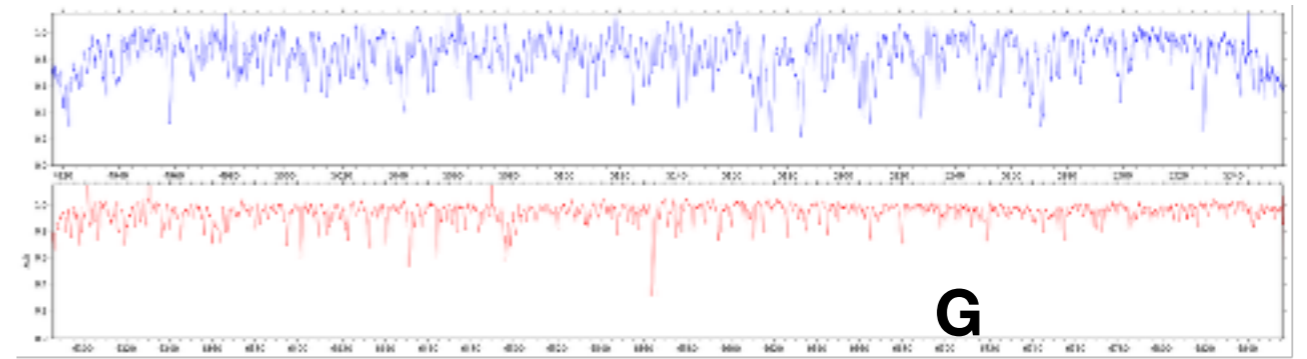
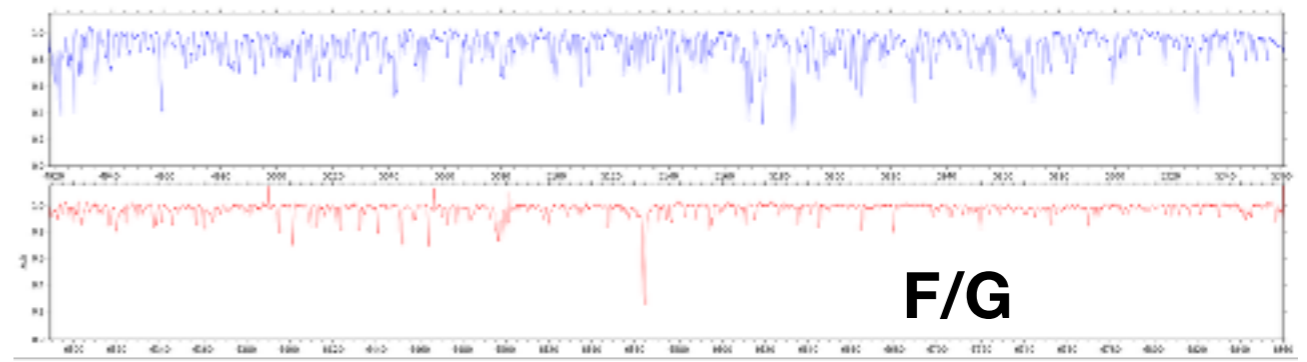
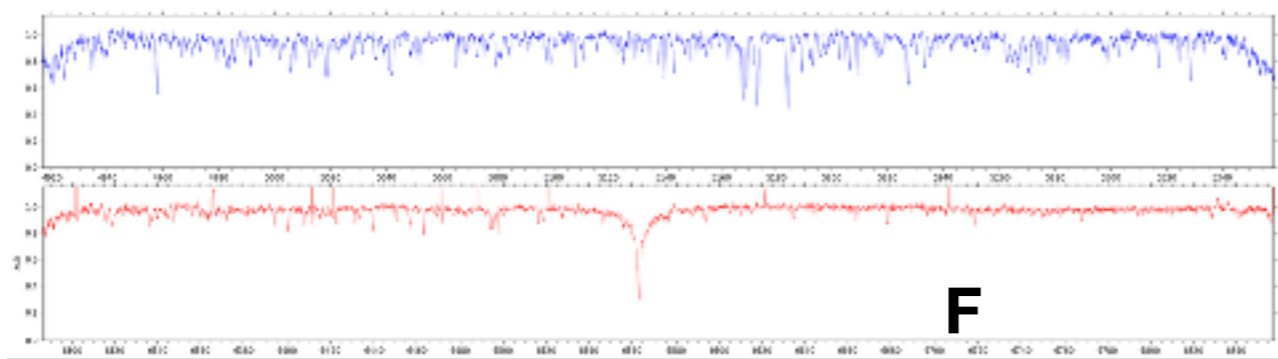
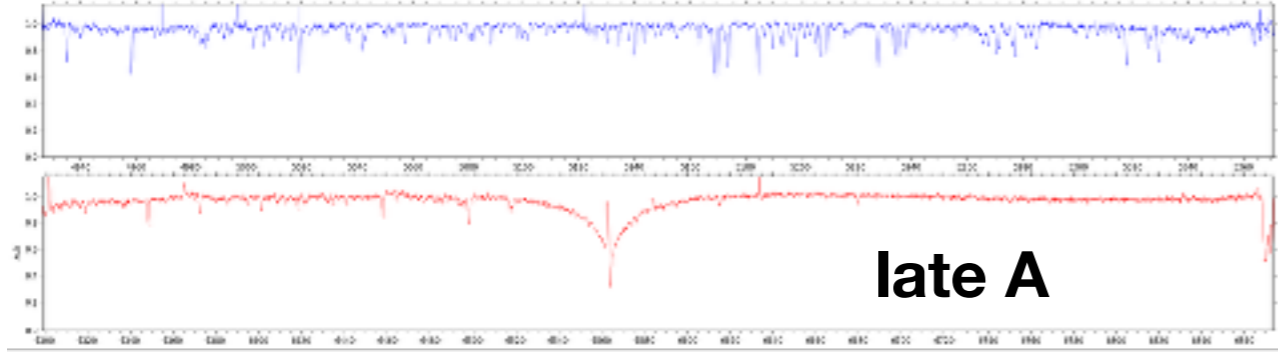
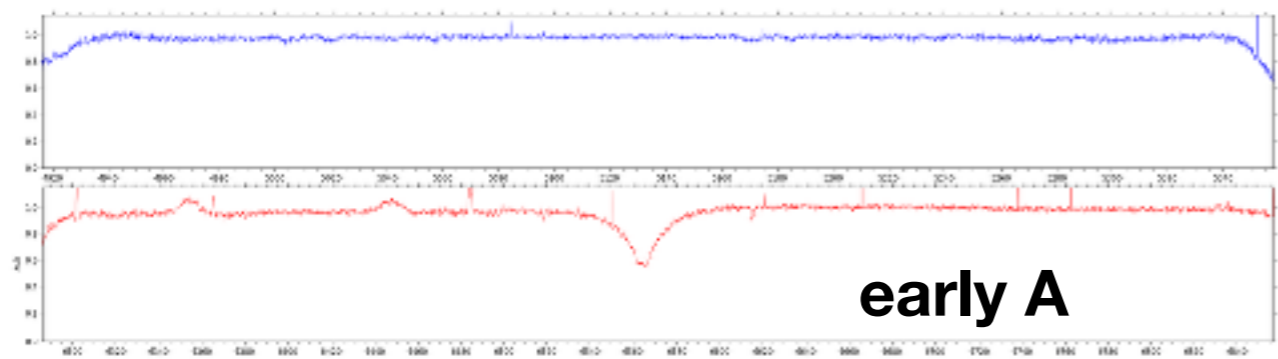
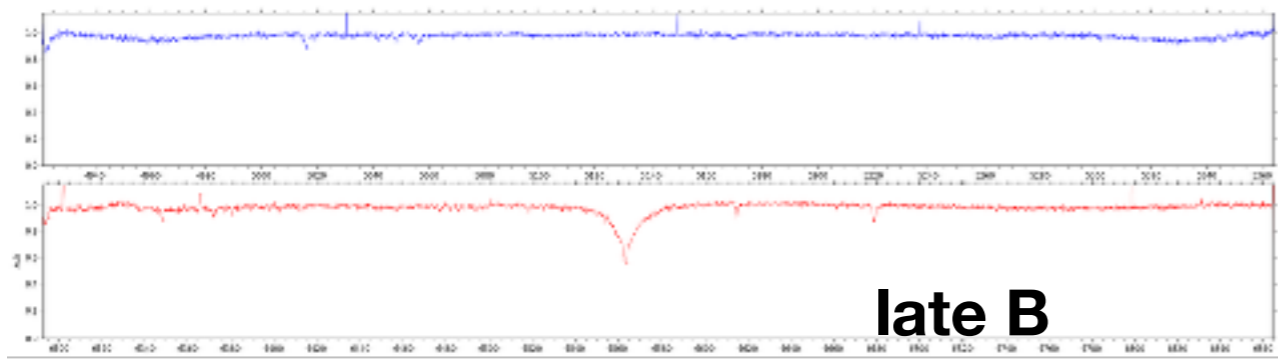
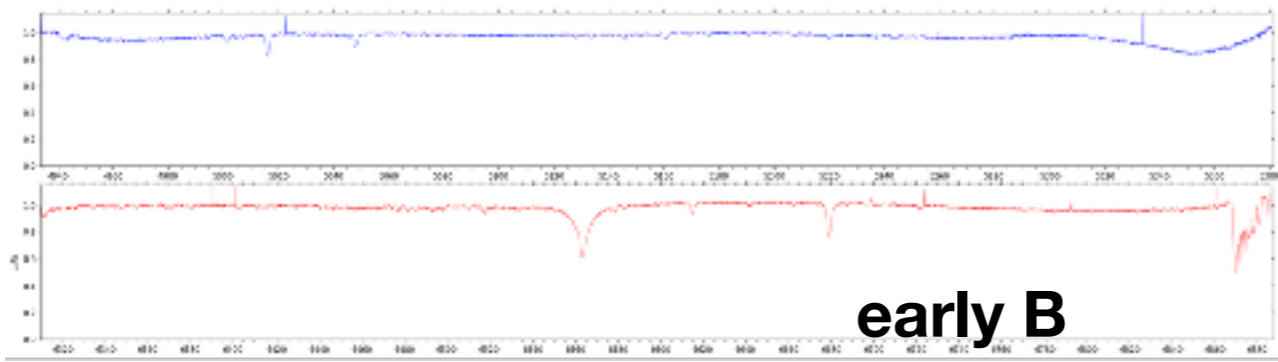
- Gratings are updated and able to switch to  $R \sim 7500$ 
  - Blue arm: 496-533 nm (Mg Triplet, metal lines)
  - Red arm: 630-680 nm (H $\alpha$ , Li)
- With medium-resolution
  - limiting magnitude with 20 min exposure:  $G < \sim 14$  mag (s/n > 10)

# ~20 elemental abundances

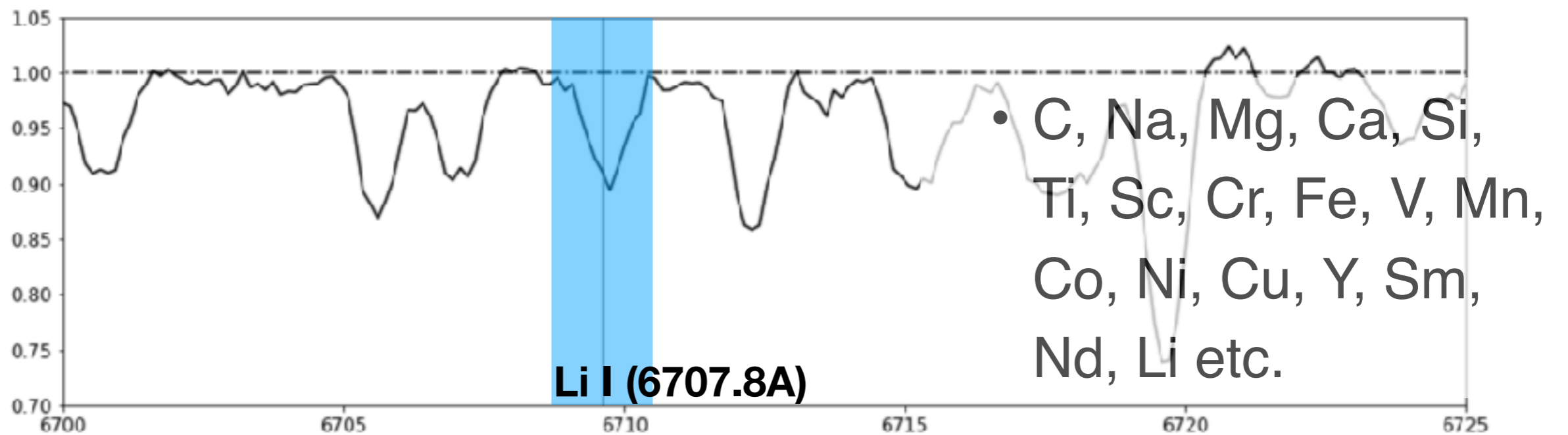
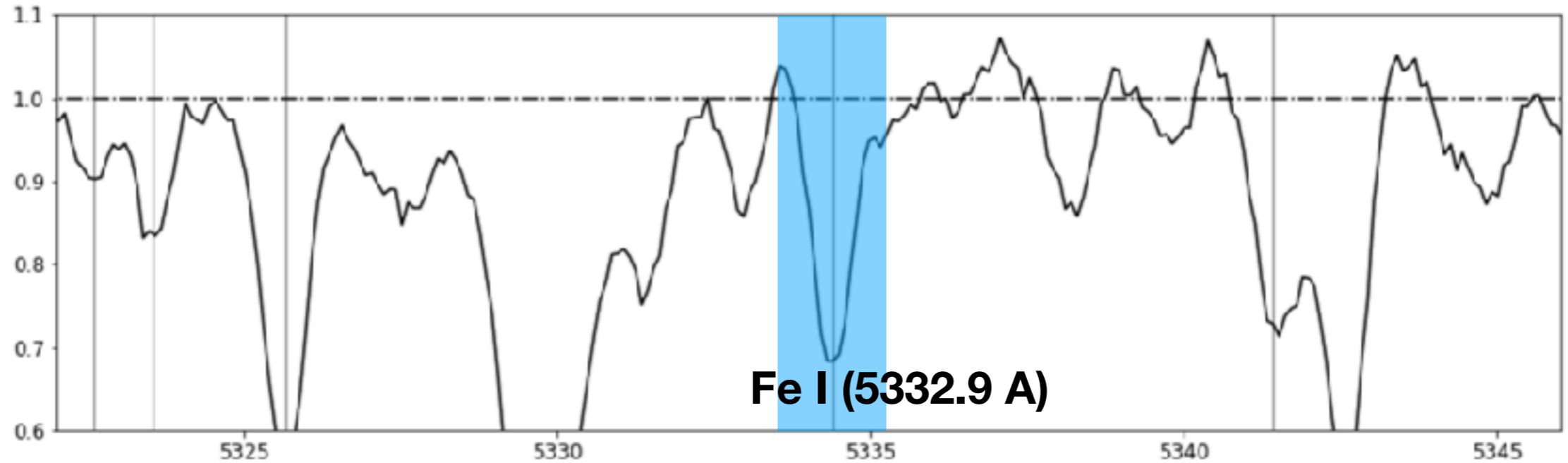


- C, Na, Mg, Ca, Si, Ti, Sc, Cr, Fe, V, Mn, Co, Ni, Cu, Y, Sm, Nd, Li etc.



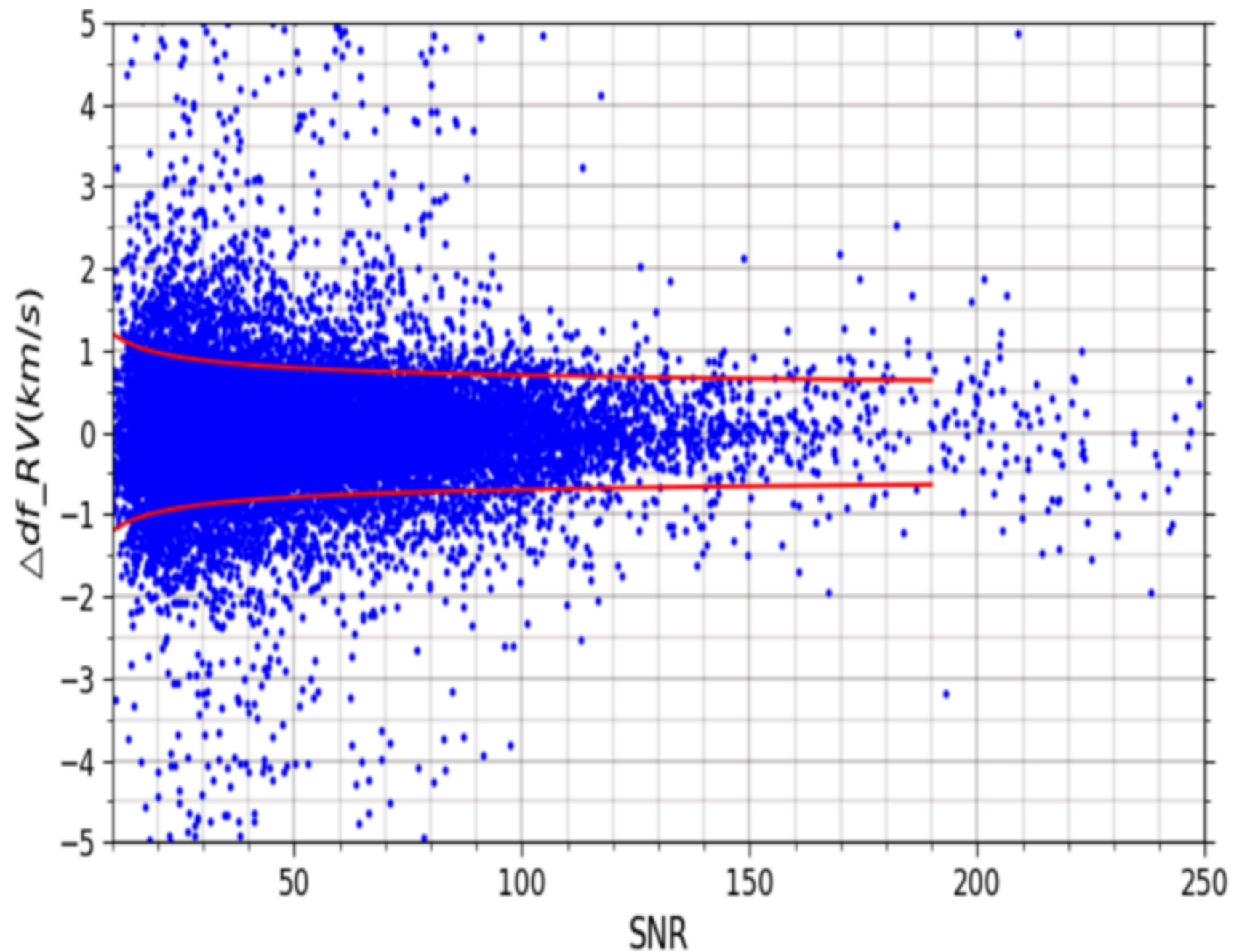


# ~20 elemental abundances

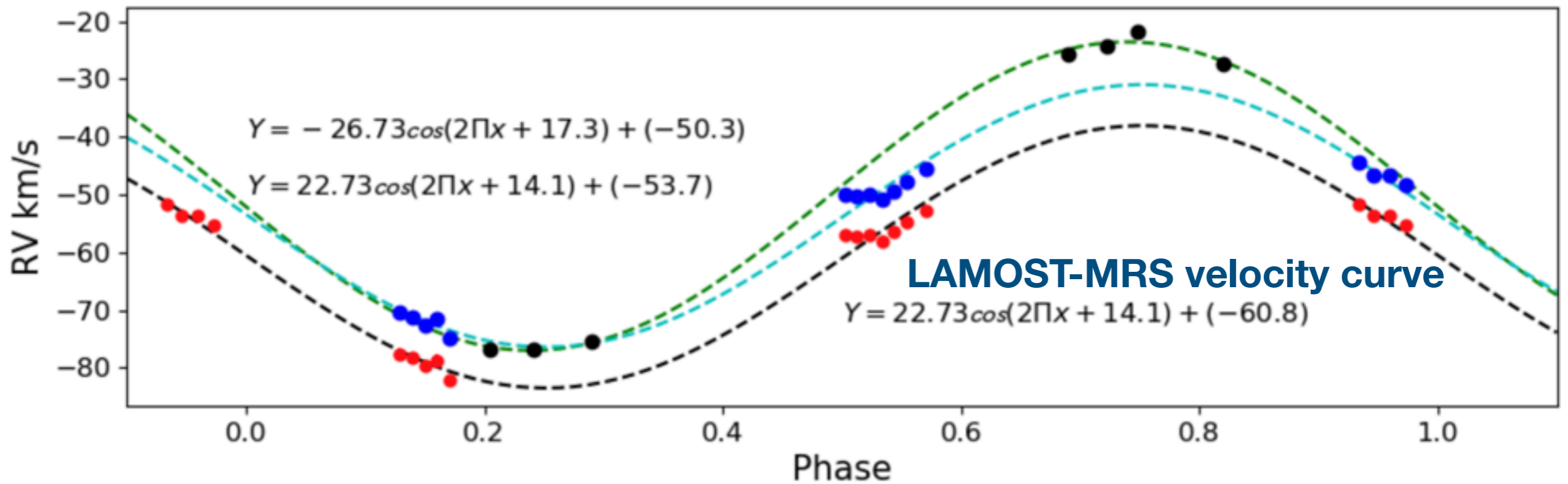
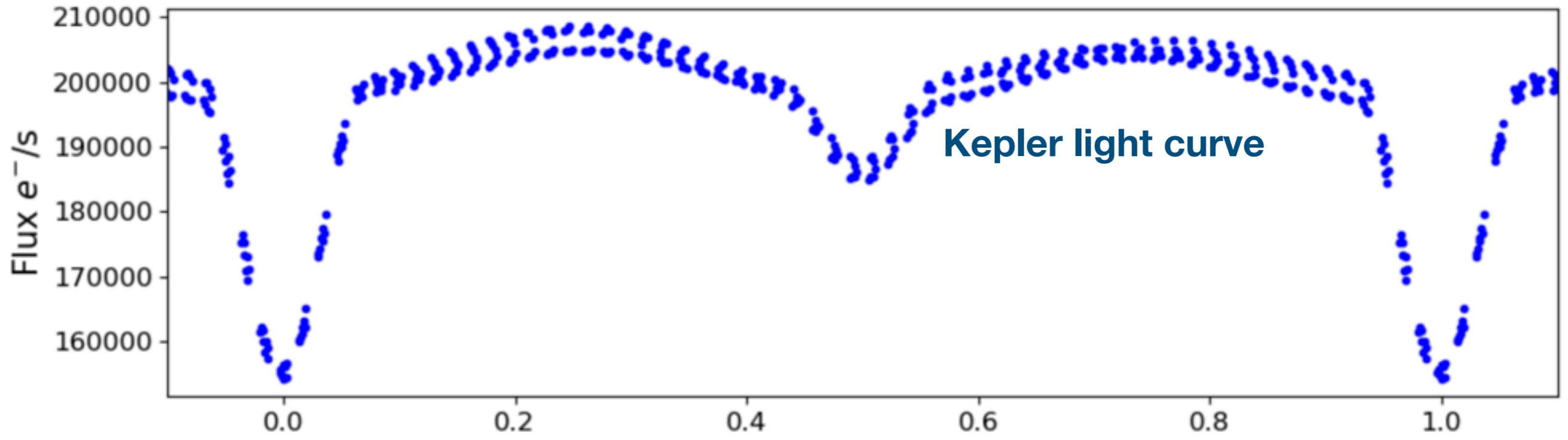


# Radial velocity

Precision is around 1 km/s

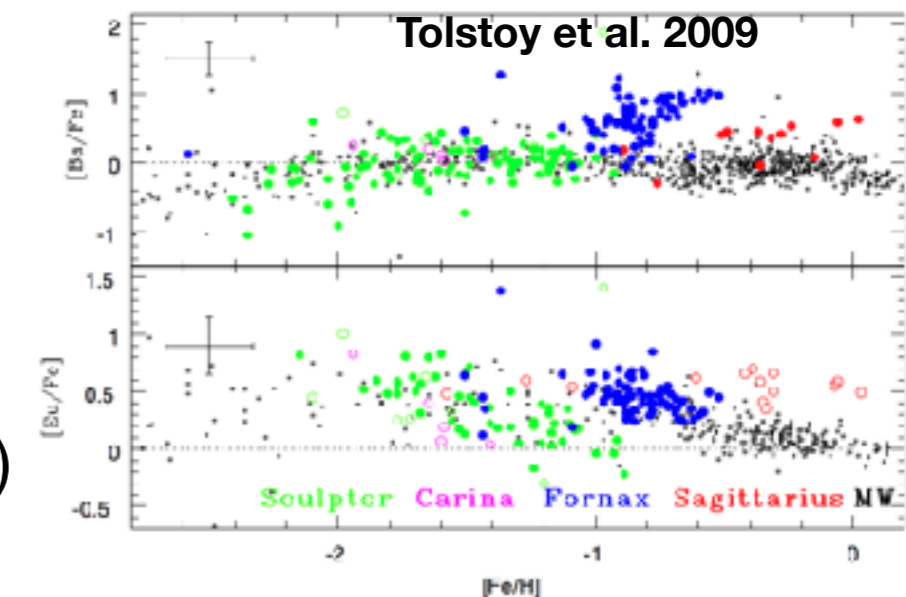
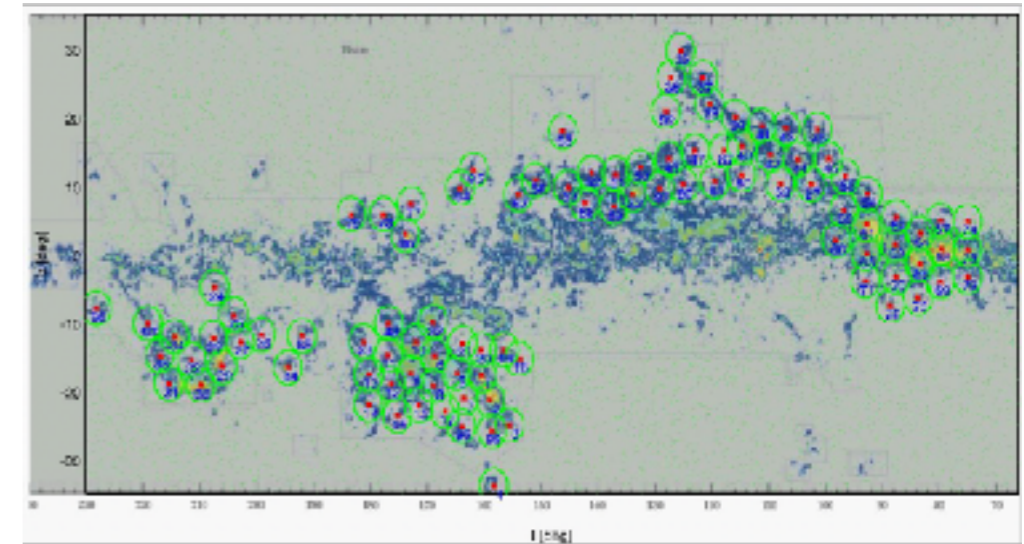
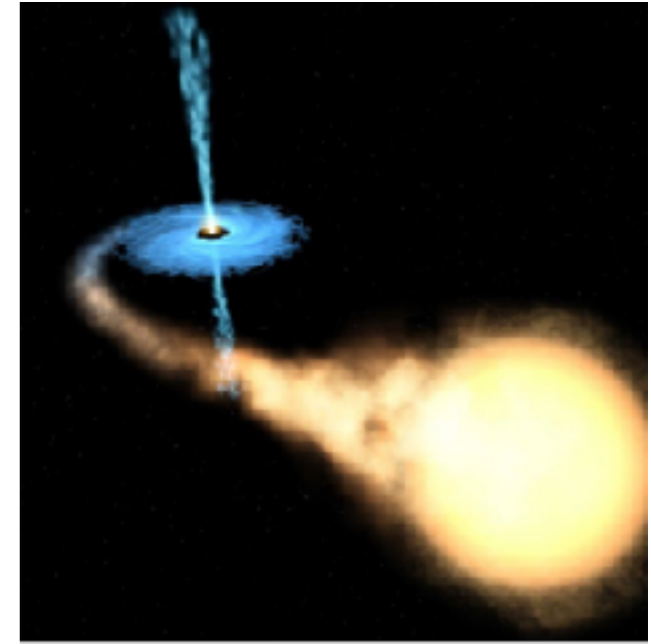


# An sample of a Kepler observed eclipsing binary star



# Scientific goals

- Stellar astrophysics (time-domain observations required)
  - Variable stars (pulsation & asteroseismology)
  - Binary stars
  - Pre-Main sequence stars
- Star clusters
- Galactic archeology
- Nebula regions — H II regions, SNR, PNe etc
- Exoplanet host stars (time-domain observations required)

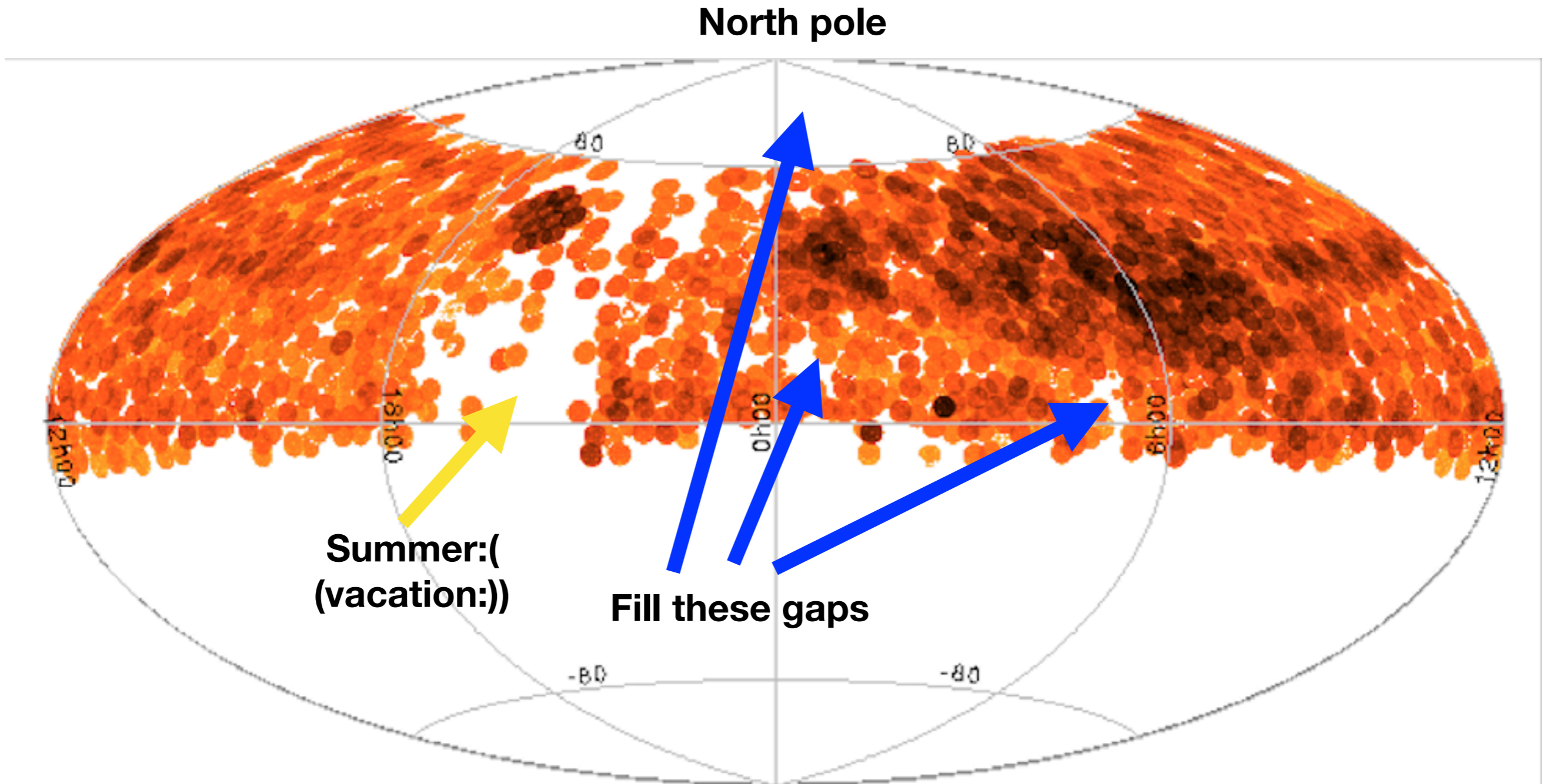




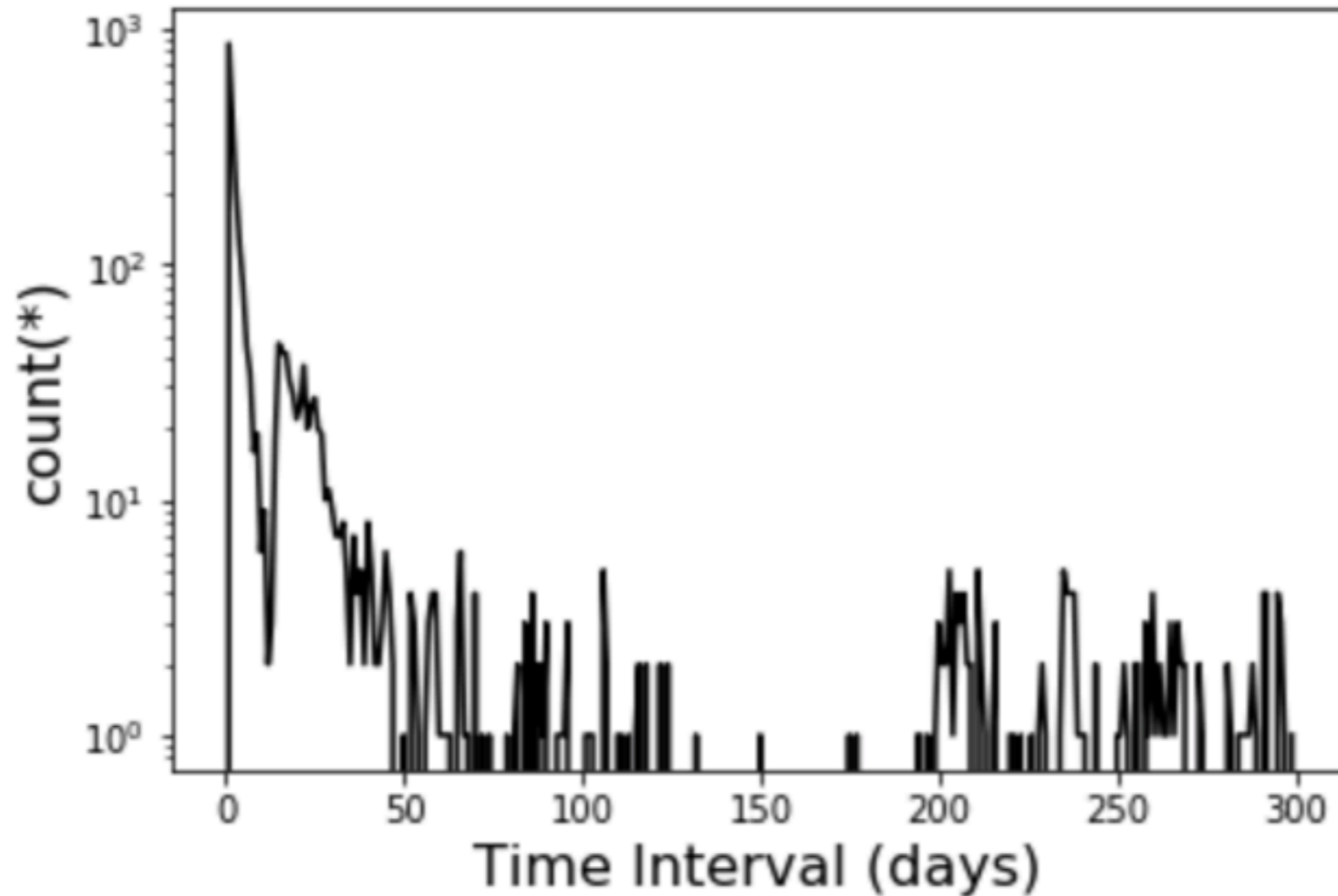
# Survey plans

- 5-year survey: Oct 2018-Jun 2023
- Dark/gray nights (14 nights/month): low-res survey same as LAMOST I
- Bright/gray nights (13 nights/month): med-res survey (MRS)
- Expected numbers of spectra
  - low-res: ~3 million more spectra with 1.5h exposure (stars + galaxies + QSOs),  $r < 18$
  - med-res: **~200 K stars with time-domain spectra** ( $20'' \times n_{\text{epoch}}$ ,  $\langle n_{\text{epoch}} \rangle \sim 60$ ),  **$G < 14$**
  - med-res: **~2 million stellar spectra** ( $20'' \times 3$  exposure),  **$G < 15$**

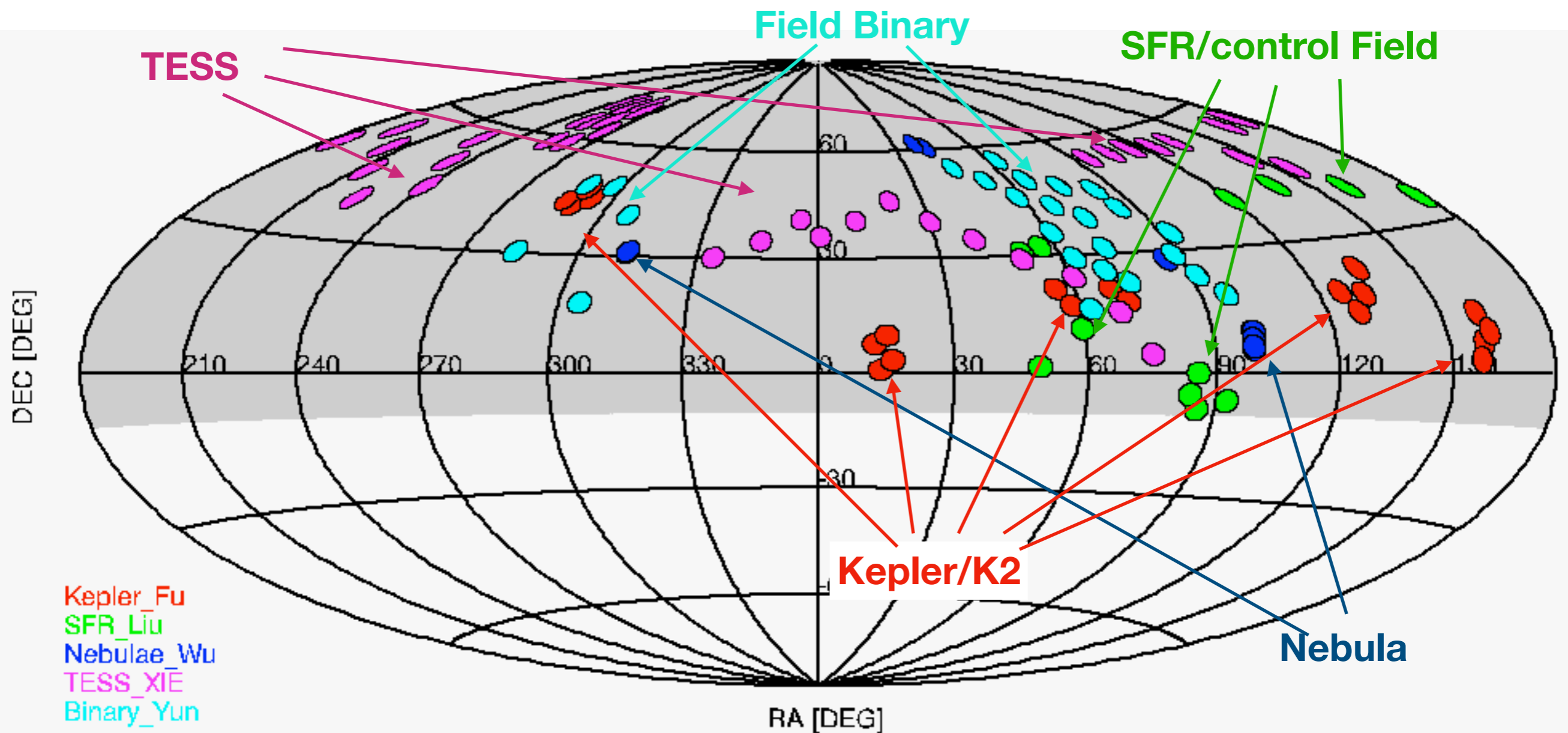
# Low-Res survey



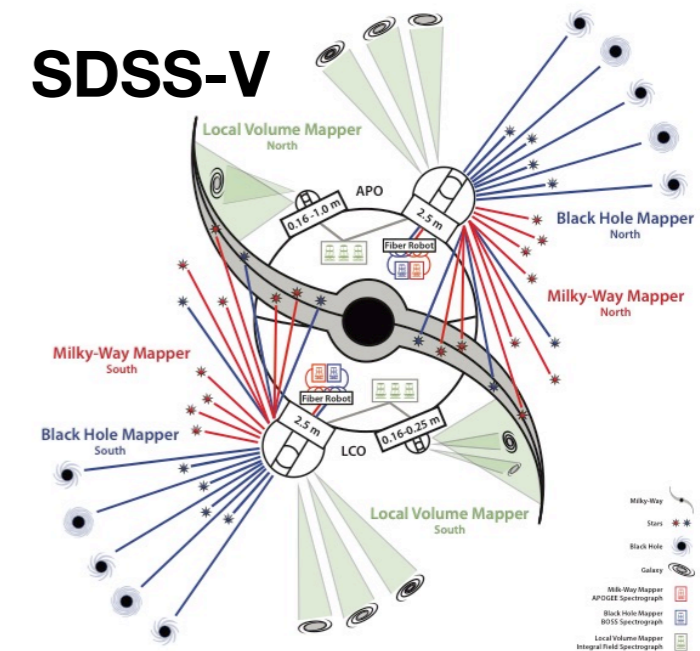
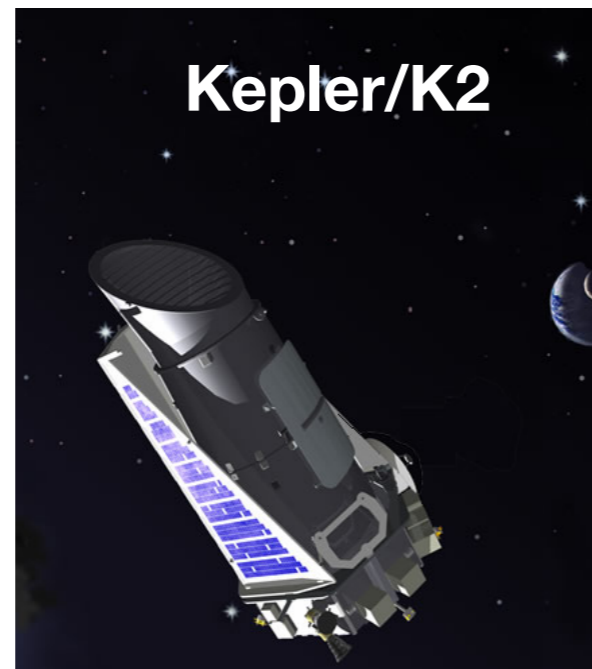
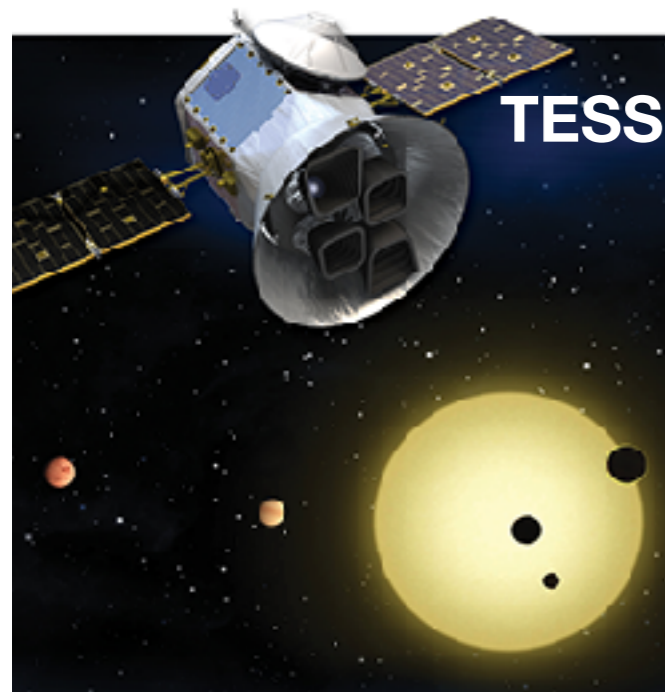
# Simulated time-domain observation sample



# Footprints of time-domain regions



# Synergy with other missions



LAMOST II



# Summary

- LAMOST II = Low-res + Med-res
- LAMOST II ==> Med-res Time-domain survey
- Future products:
  - 200K time-domain med-res stars ( $G < 14$ )
  - 2 million single-epoch med-res spectra ( $G < 15$ )
  - ~13 million low-res spectra (inc. LAMOST I) ( $r < \sim 18$ )

# **THE MILKY WAY 2019: LAMOST AND OTHER LEADING SURVEYS**

**Yichang, China, Oct. 14th-18th, 2019**

**<http://mw2019.csp.escience.cn>**

## **TOPICS:**

- 1. Introduction to LAMOST and other leading surveys**
- 2. Stellar physics: peculiar and metal-poor stars, asteroseismology, variables/ binary stars, massive and low-mass stars**
- 3. The bulge/bar: shape, kinematics, and chemistry, theories**
- 4. The Galactic disk: kinematics and dynamics, chemo-dynamical evolution, spiral arms**
- 5. The Galactic halo: structure of the stellar halo, dark matter halo**
- 6. Interstellar and circumstellar materials: gas, dust, extinction, molecular cloud**
- 7. Future photometric/spectroscopic surveys**

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