

Ádám Sódor

Konkoly Observatory  
Hungary

# My interest in LAMOST–Kepler

2nd LAMOST–*Kepler* Workshop, Royal Observatory of Belgium, Brussels

---

2017.08.02.



# My main involvement in LAMOST

---

- ❖ Studying **hybrid delta Scuti** – **gamma Dor** *Kepler* candidates.
- ❖ But **Patricia Lampens** and **Lore Vermeylen** already told everything about it on Monday.



# Systematic semi-automatic search for $\gamma$ Dor and $\delta$ Sct pulsators

---

- ❖ In the full, 4-year-long *Kepler* data.
- ❖ In the 5500–10 000 K temperature range (KIC).
- ❖ 123 939 targets.
- ❖ Light-curve download, pre-process, Fourier-transform, peak counts in the 0–5, 5–10, and 10–24.8 c/d ranges.
- ❖ Manual revision and classification of stars with 2 or more significant peaks in any of the ranges.



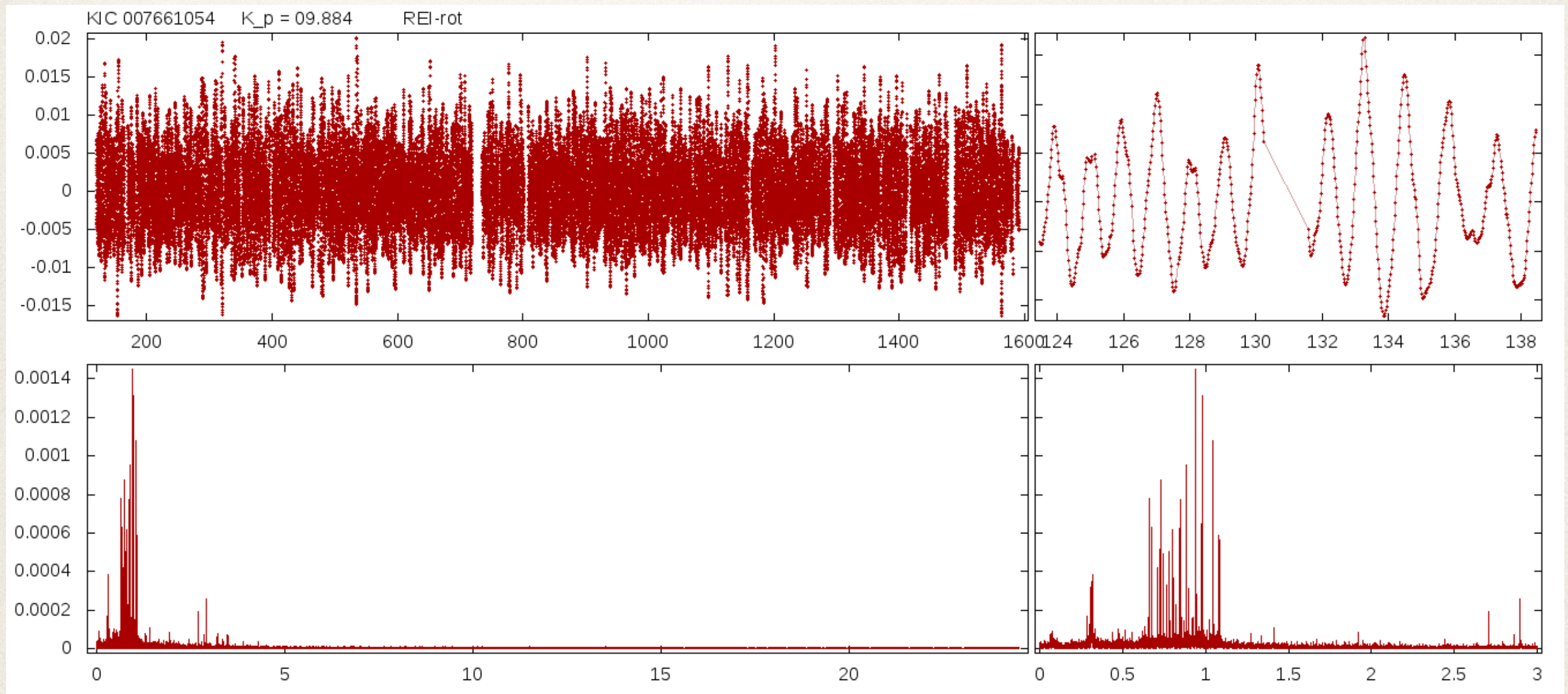
# Rotation of A–F stars

---

- ❖ **Balona** (2013, MNRAS, 431, 2240) found that 40% of all *Kepler* A stars show a specific frequency signature in their periodogram, probably from rotational spot modulation.
- ❖ But A stars are thought to have no surface temperature spots due to the lack of a convective envelope.
- ❖ Can it be rotation?
  - ❖ **Balona** (2013) says, **yes, it can** – based on indirect evidence.
  - ❖ **Murphy et al.** (2016, MNRAS, 459, 1201) says, **no, it cannot** – based on  $v \sin i$  of a single object.
- ❖  $v \sin i$  measurements are needed.



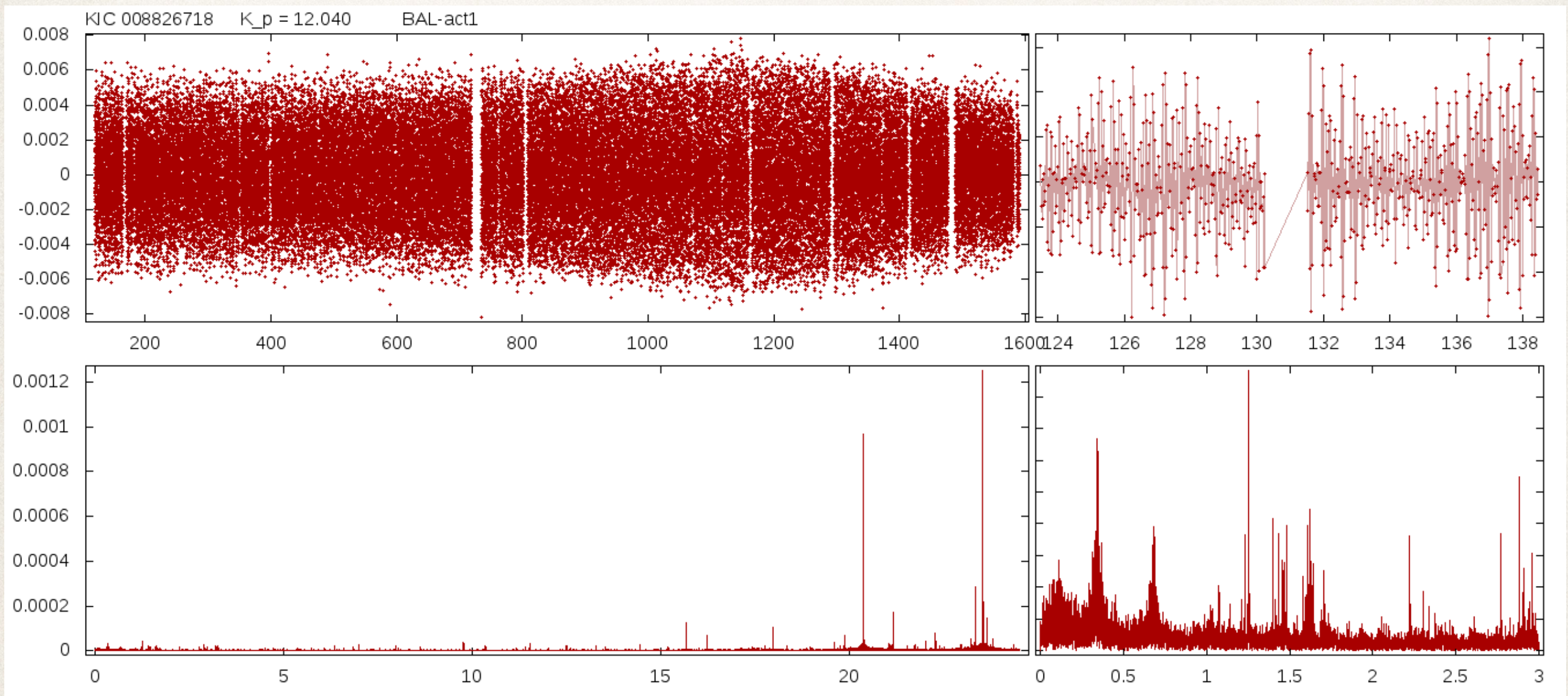
# A few examples



Murphy et al. (2016, MNRAS, 459, 1201)



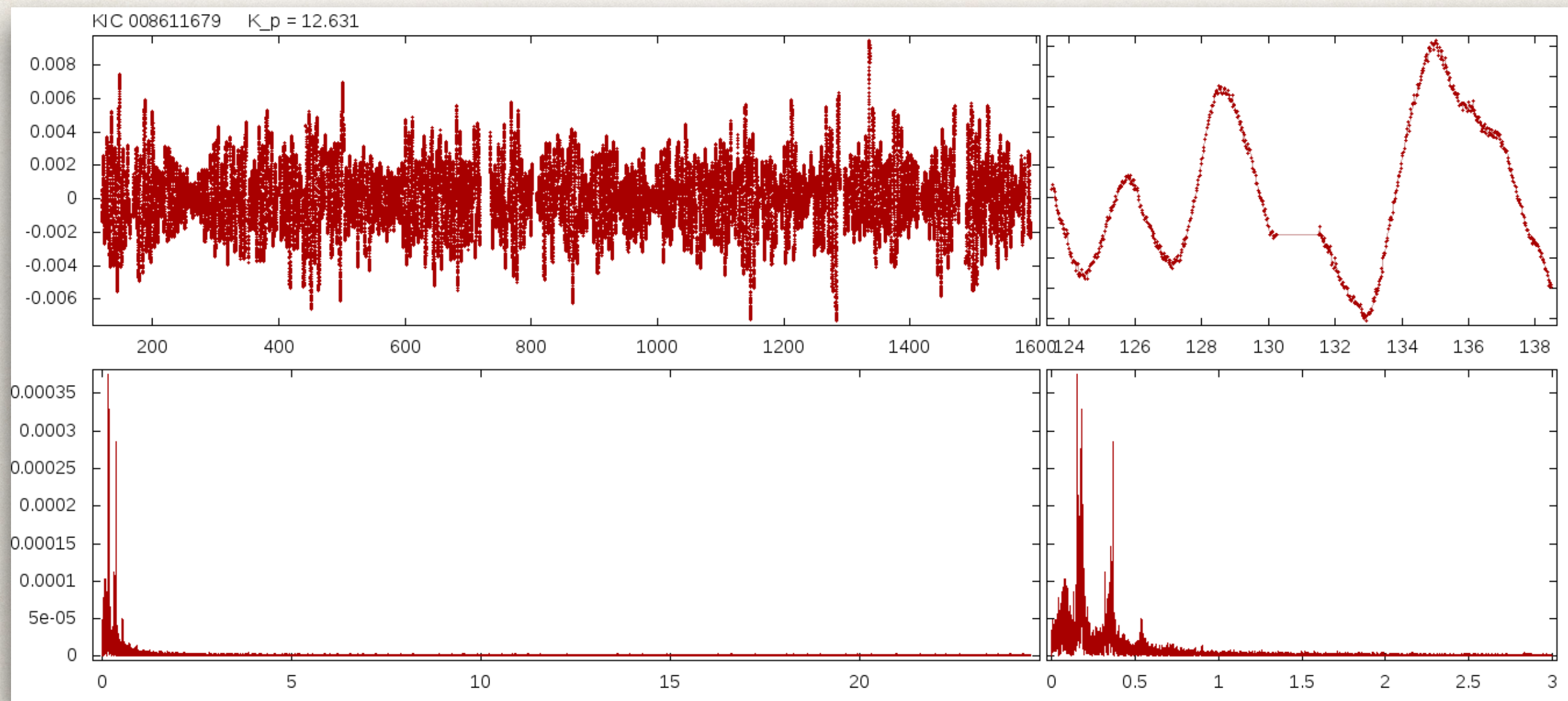
# A few examples



$T_{\text{eff}} = 8050 \text{ K}$     $P = 3 \text{ d}$    new hybrid candidate



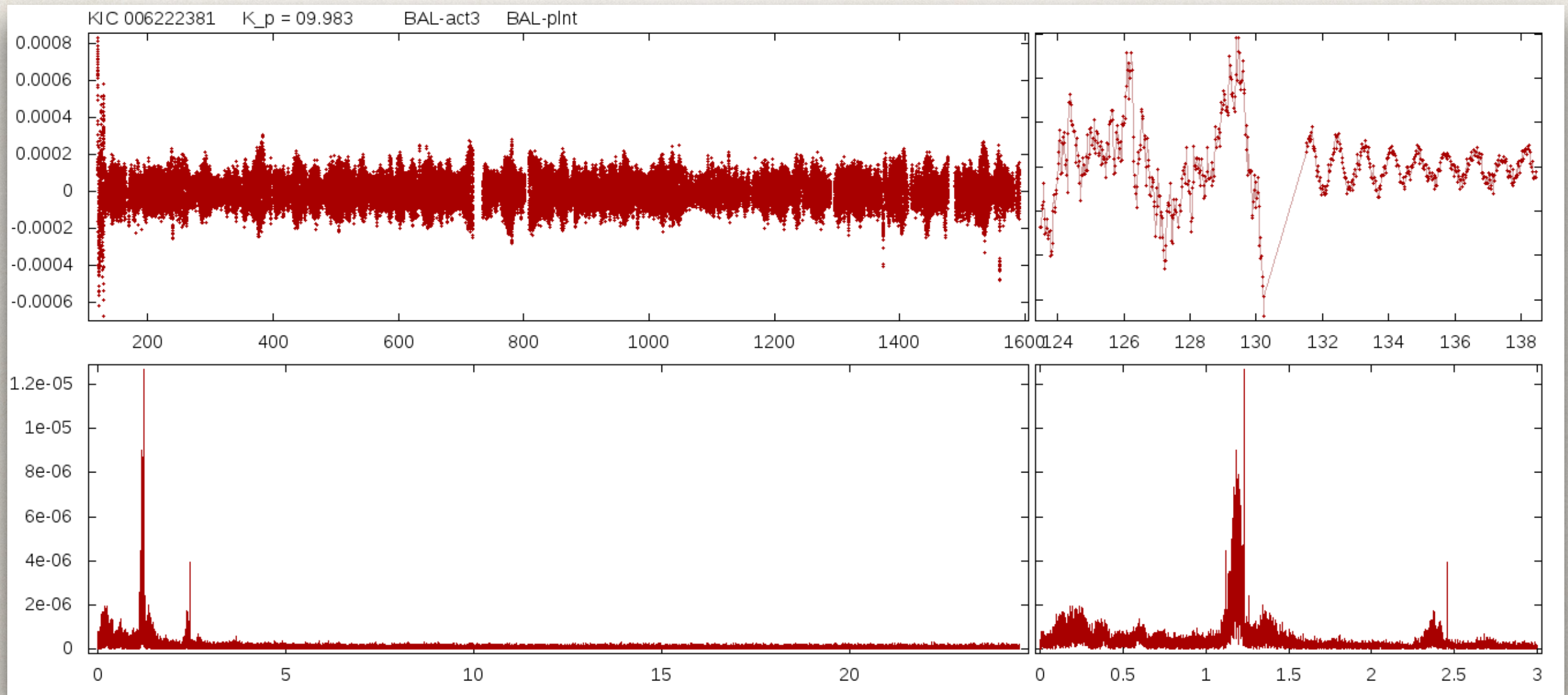
# A few examples



$T_{\text{eff}} = 8100 \text{ K}$     $P = 5 \text{ d}$



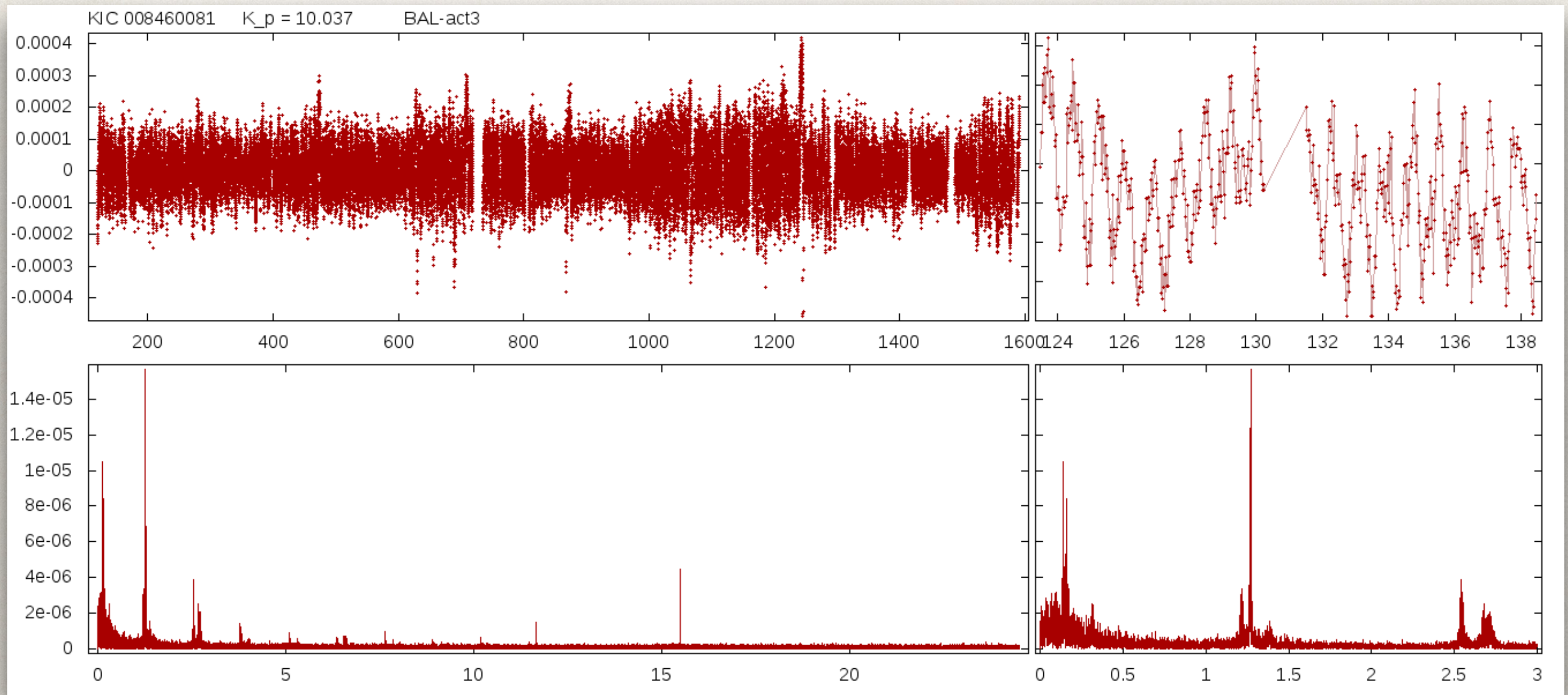
# A few examples



$T_{\text{eff}} = 8675 \text{ K}$     $P = 0,8 \text{ d}$



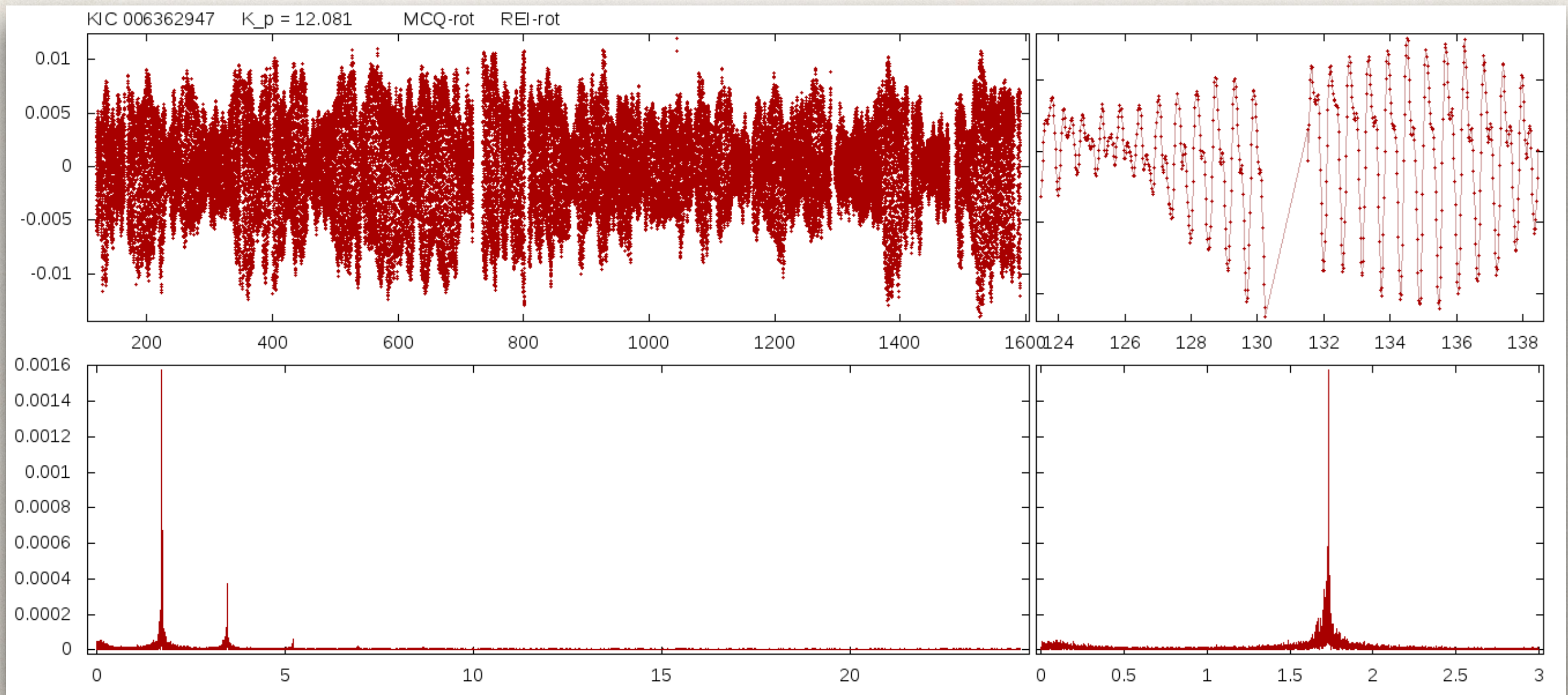
# A few examples



$T_{\text{eff}} = 8750 \text{ K}$   $P = 0,8 \text{ d}$



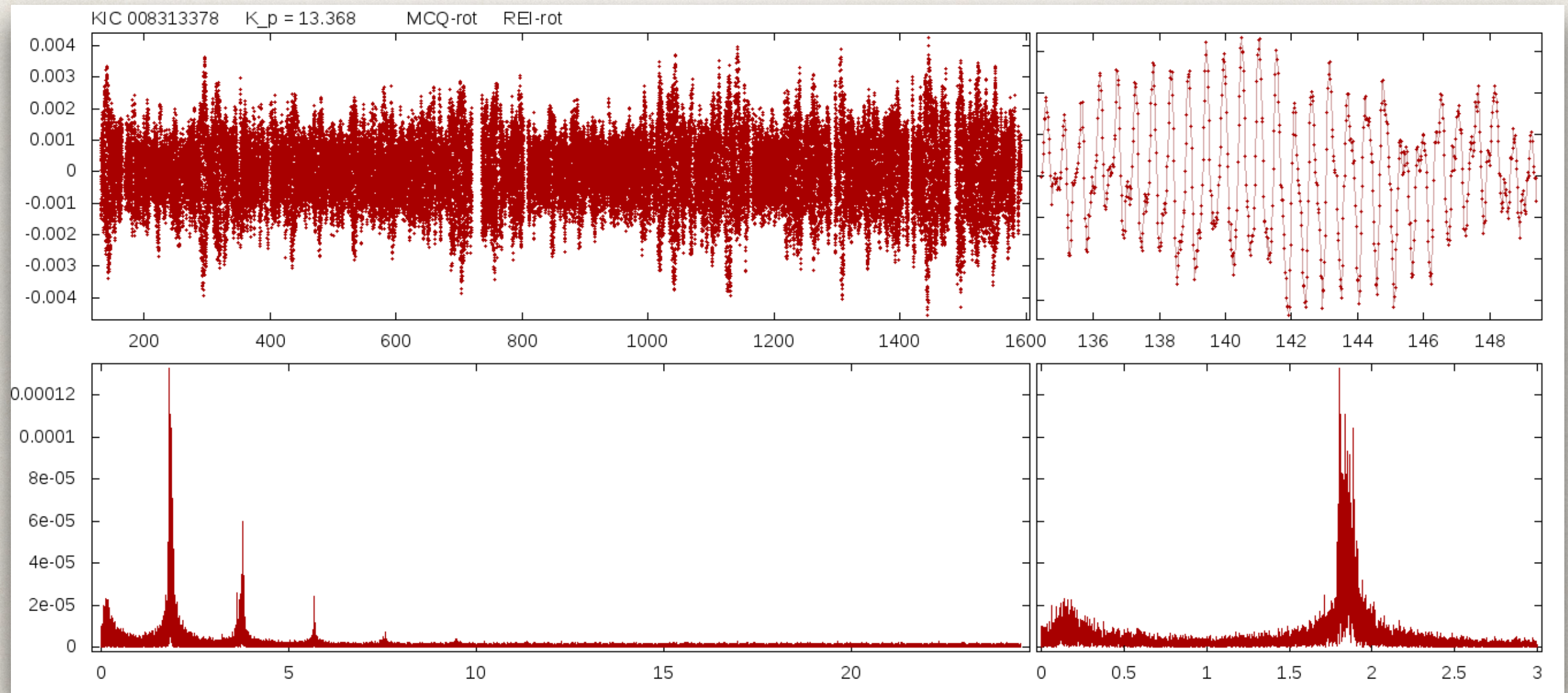
# A few examples



$T_{\text{eff}} = 9600 \text{ K}$     $P = 0,6 \text{ d}$



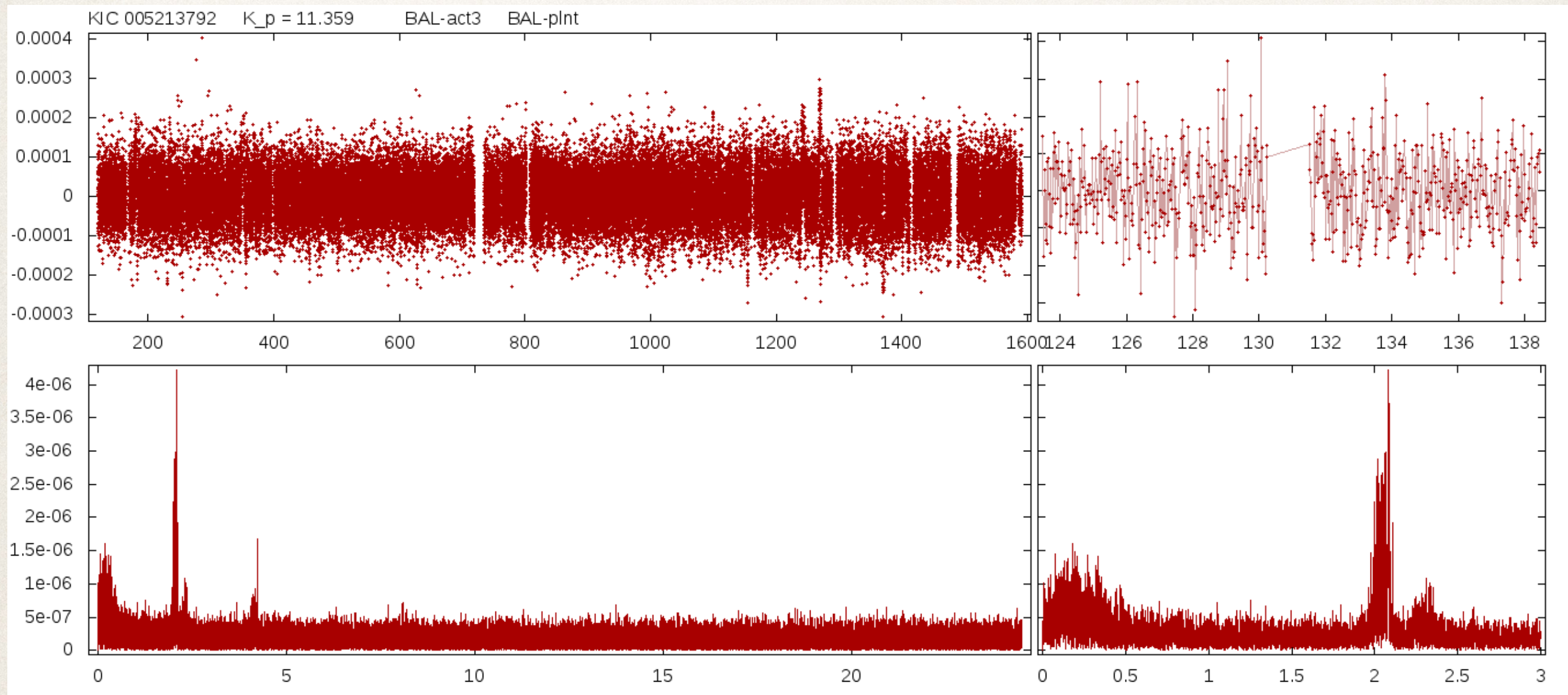
# A few examples



$T_{\text{eff}} = 9750 \text{ K}$     $P = 0,55 \text{ d}$



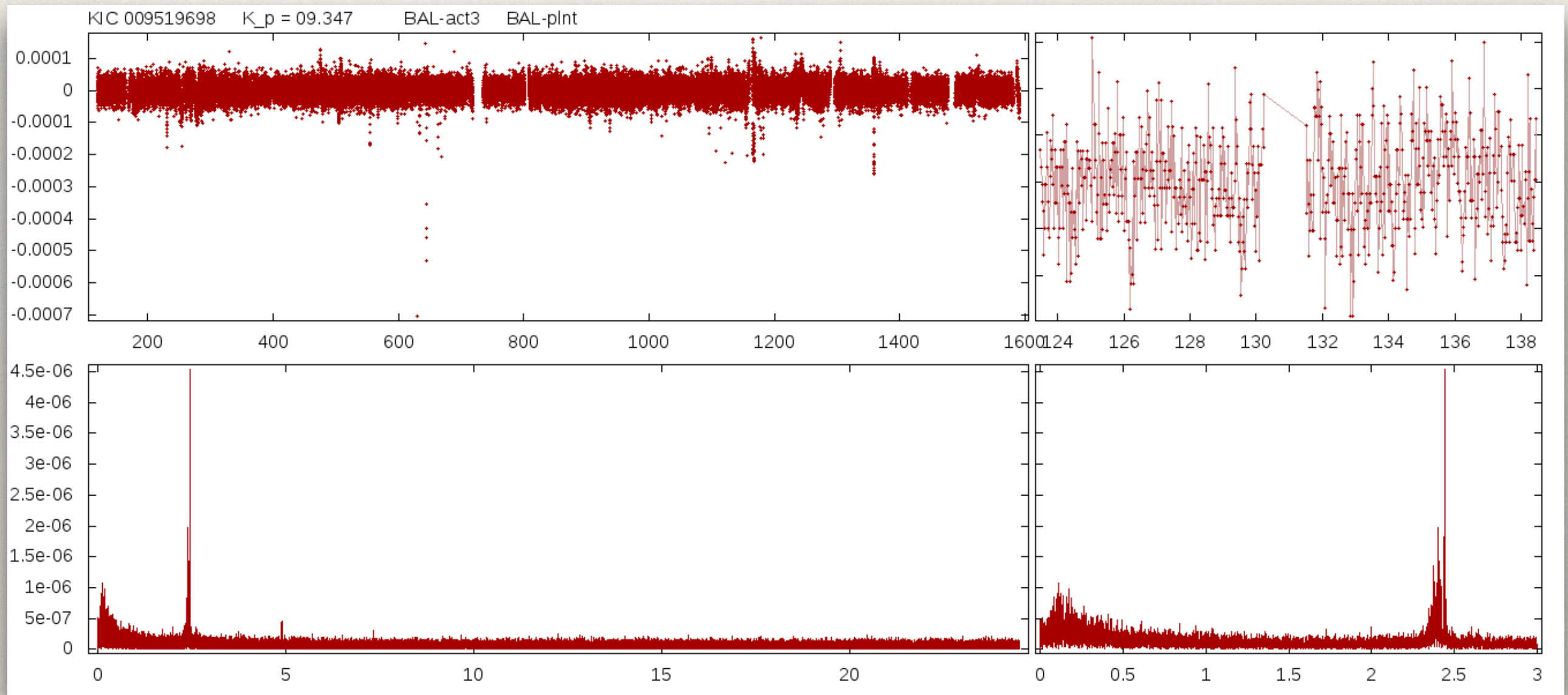
# A few examples



$T_{\text{eff}} = 9850 \text{ K}$     $P = 0,5 \text{ d}$



# A few examples



$T_{\text{eff}} = 9950 \text{ K}$     $P = 0,4 \text{ d}$



# So how could LAMOST help?

---

- ❖ With  $v \sin i$  measurements?
- ❖ With more precise fundamental stellar parameters.