

Measuring rotation from star spots in the Kepler field

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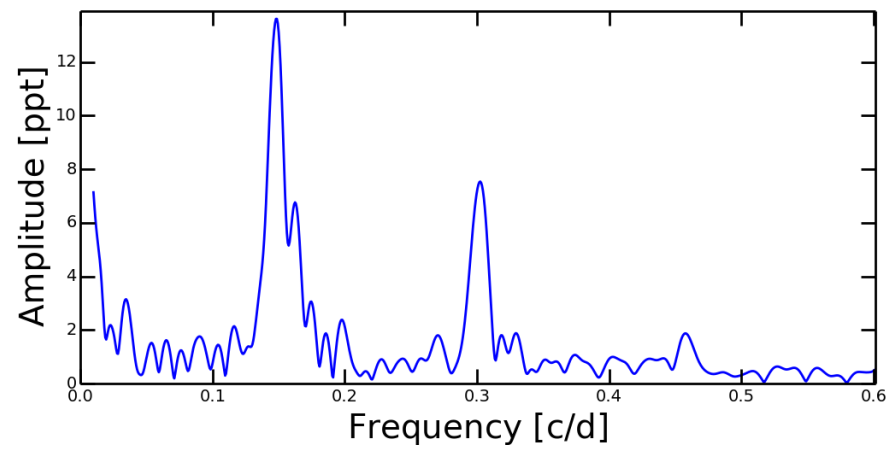
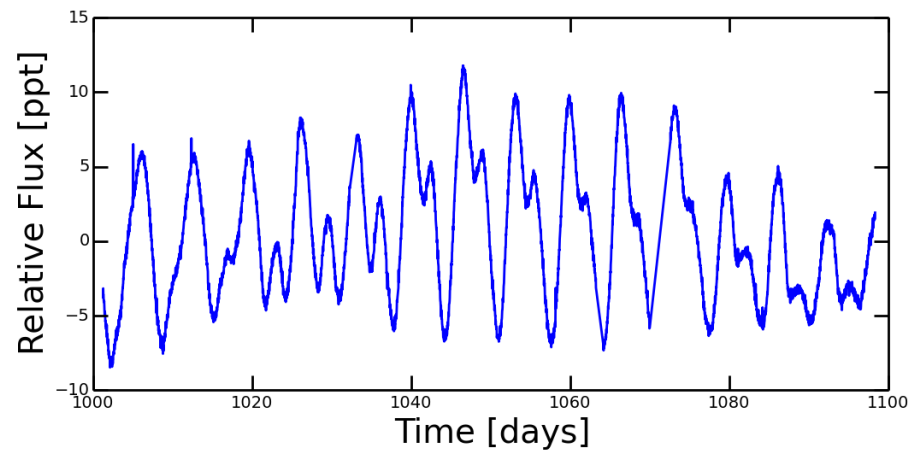
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Research

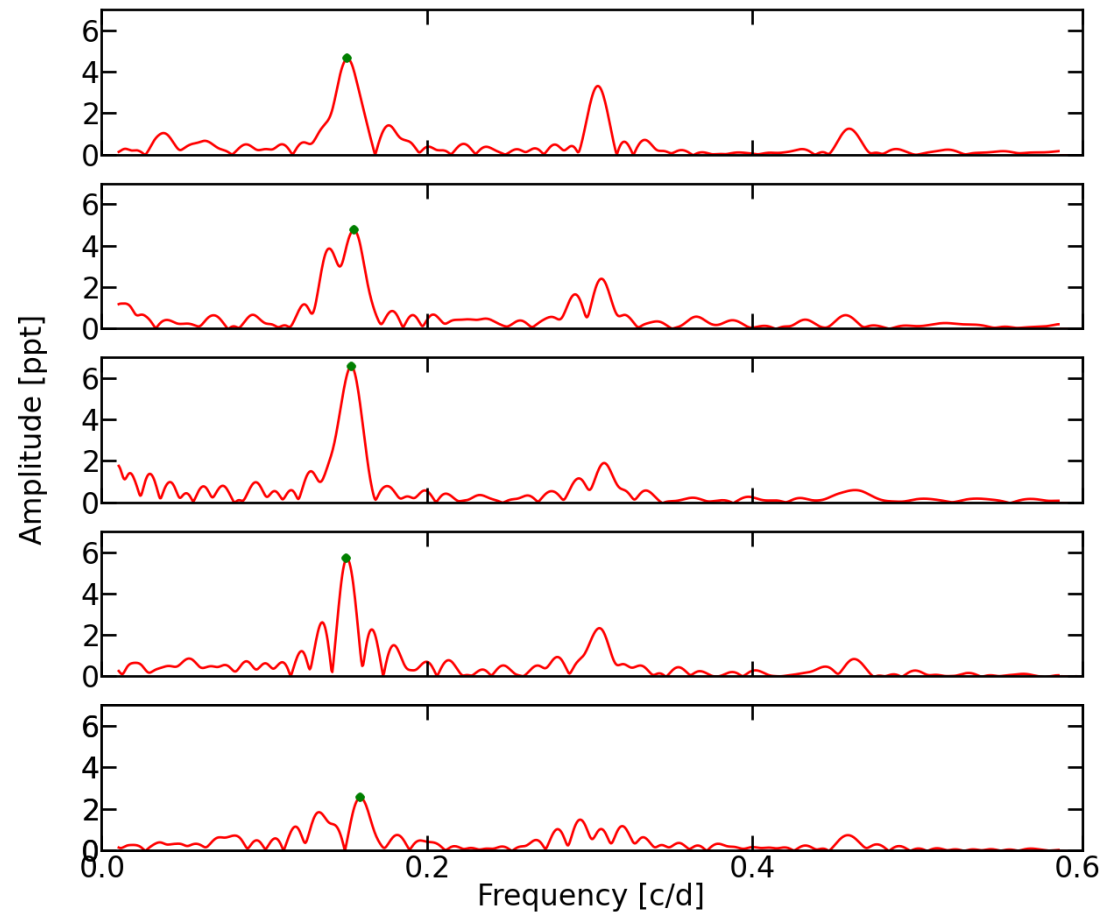
Current situation

- Lomb-Scargle
 - Nielsen et al (2013): 12,000 stars
 - Reinhold and Reiners (2013): 24,000 stars
- ACF method
 - McQuillan et al. (2013 & 2014): 34,000 stars

Nielsen et al. (2013)

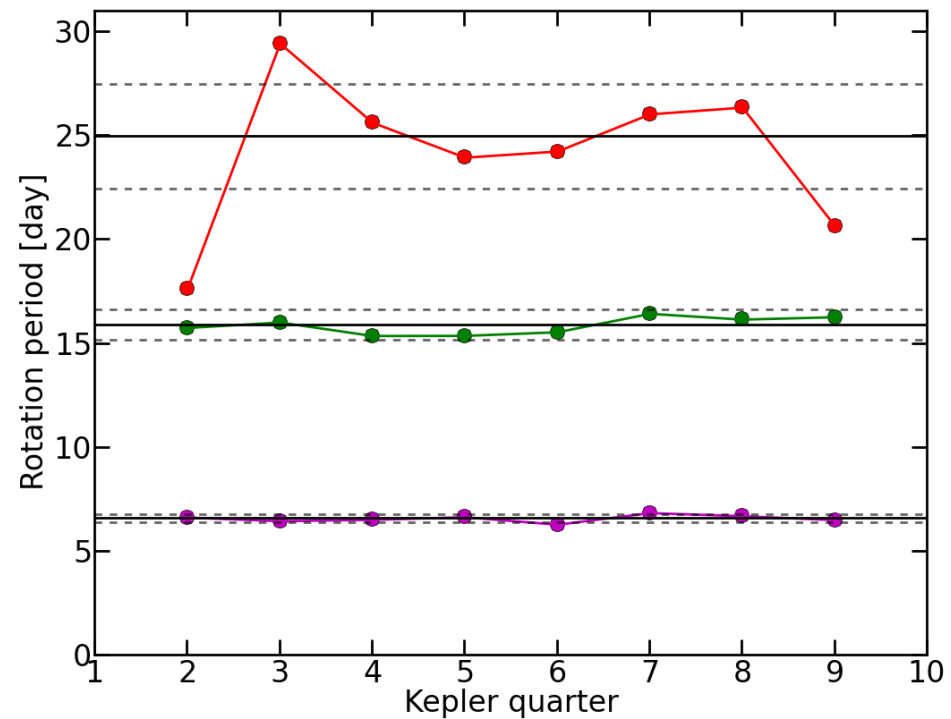


Nielsen et al. (2013)

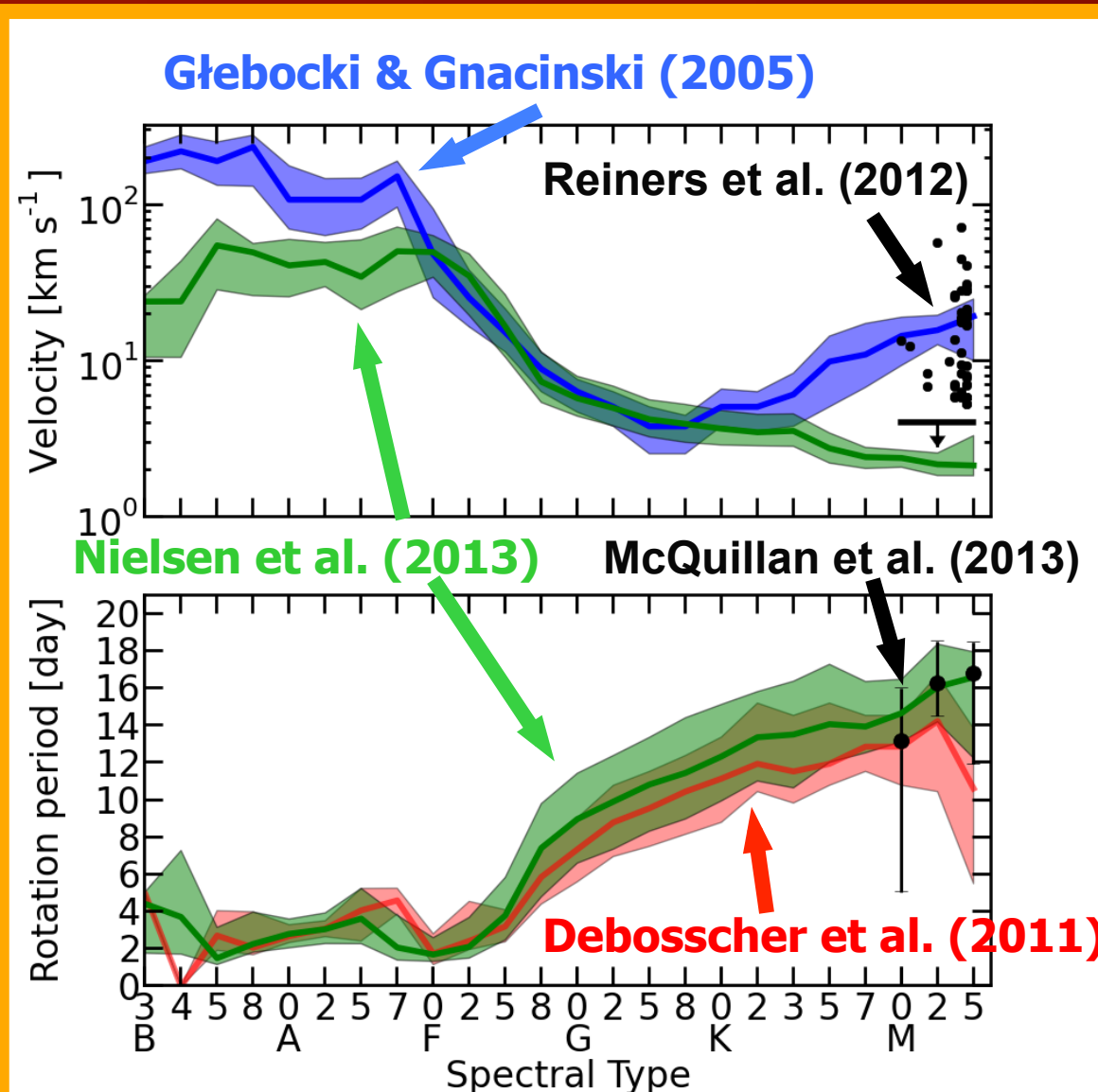


Nielsen et al. (2013)

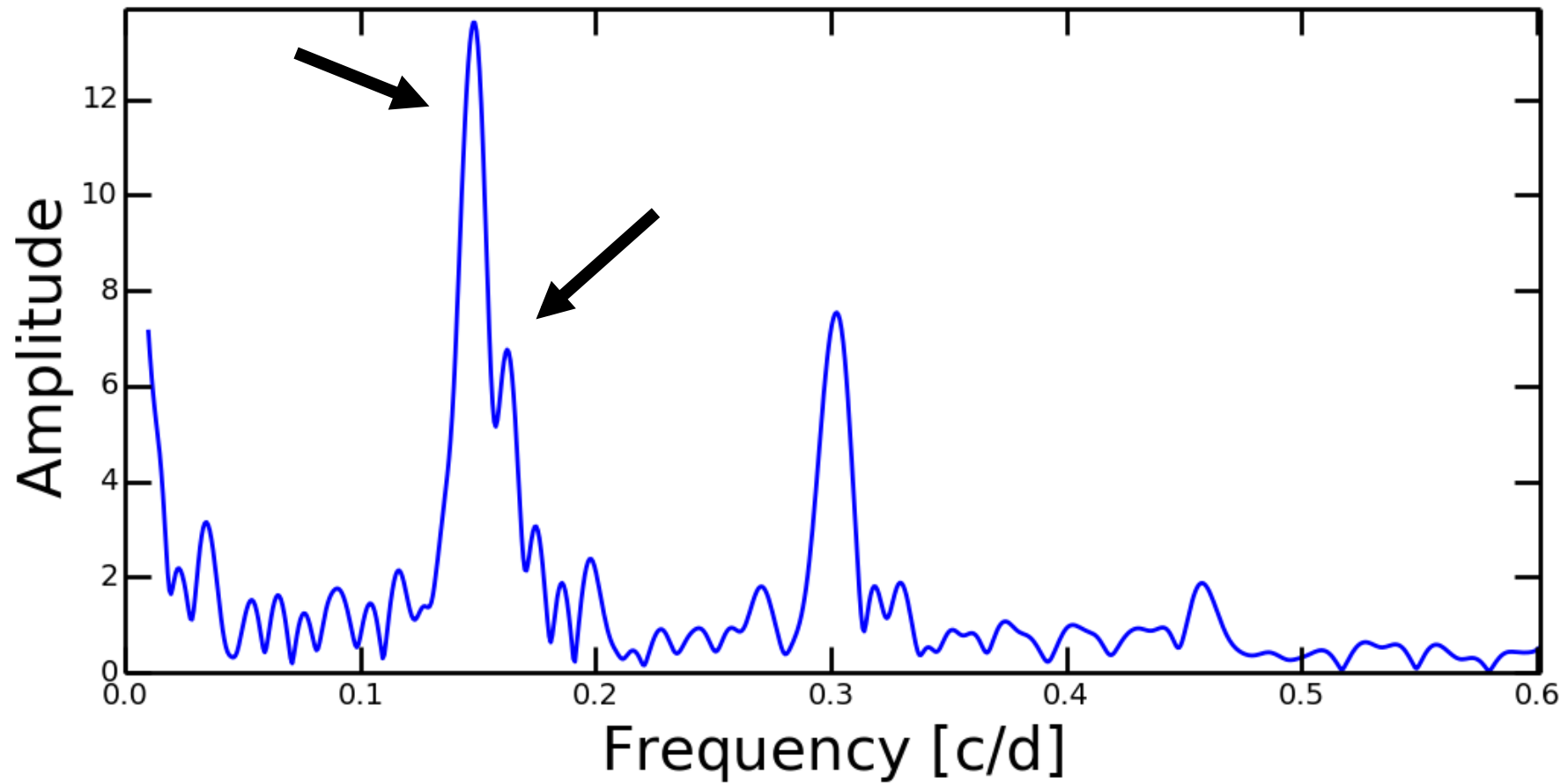
- Period < 30 days
- The scatter (MAD) must be < 1 day



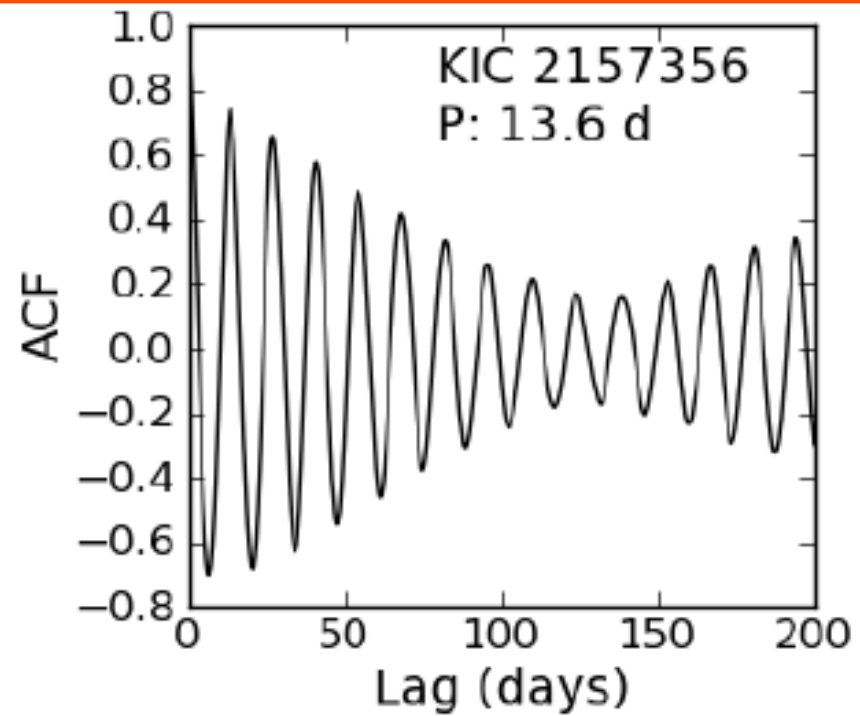
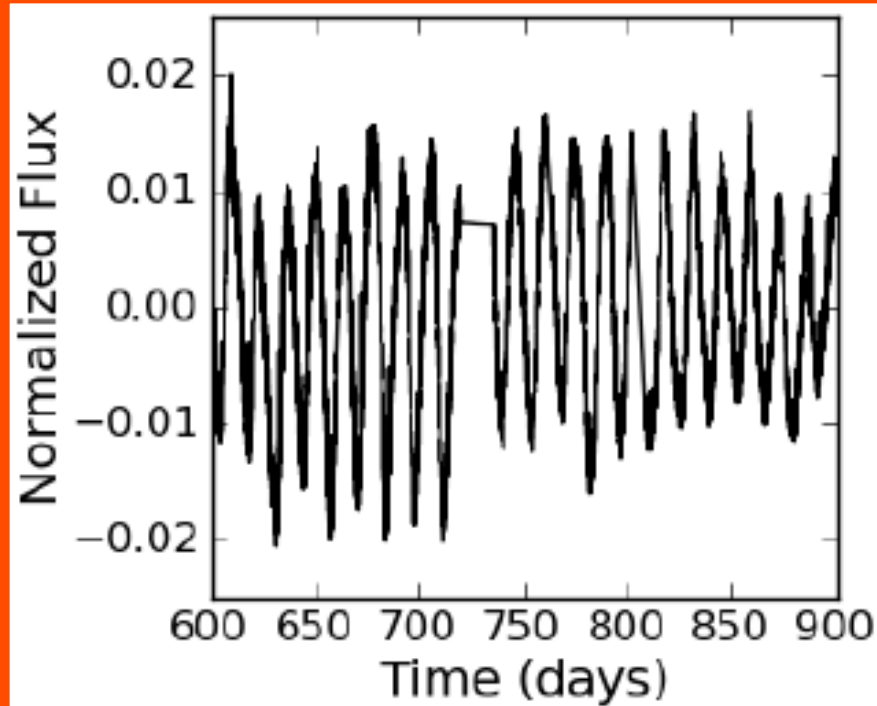
Consistency check



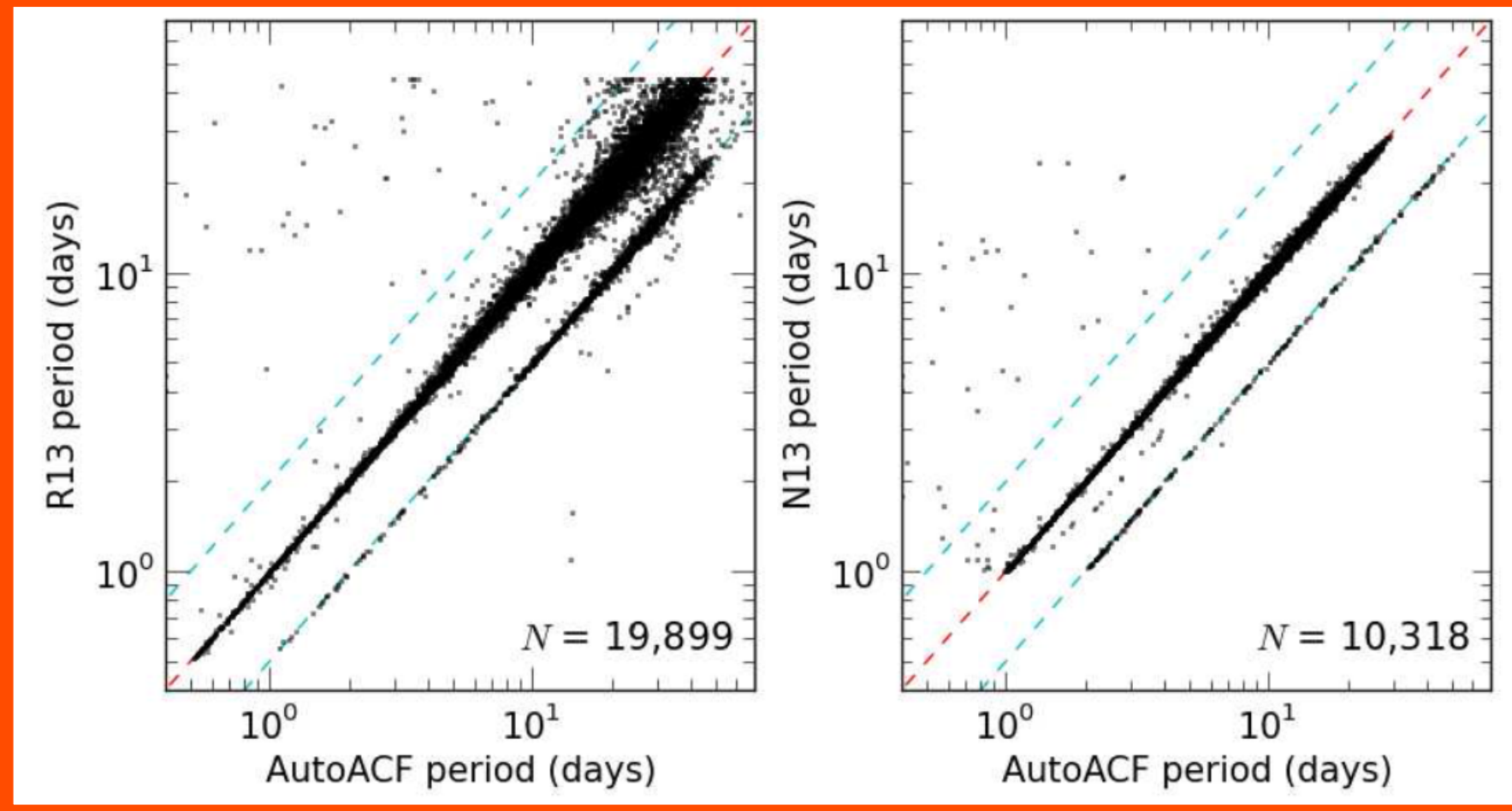
Reinhold & Reiners (2013)



McQuillan et al. (2014)

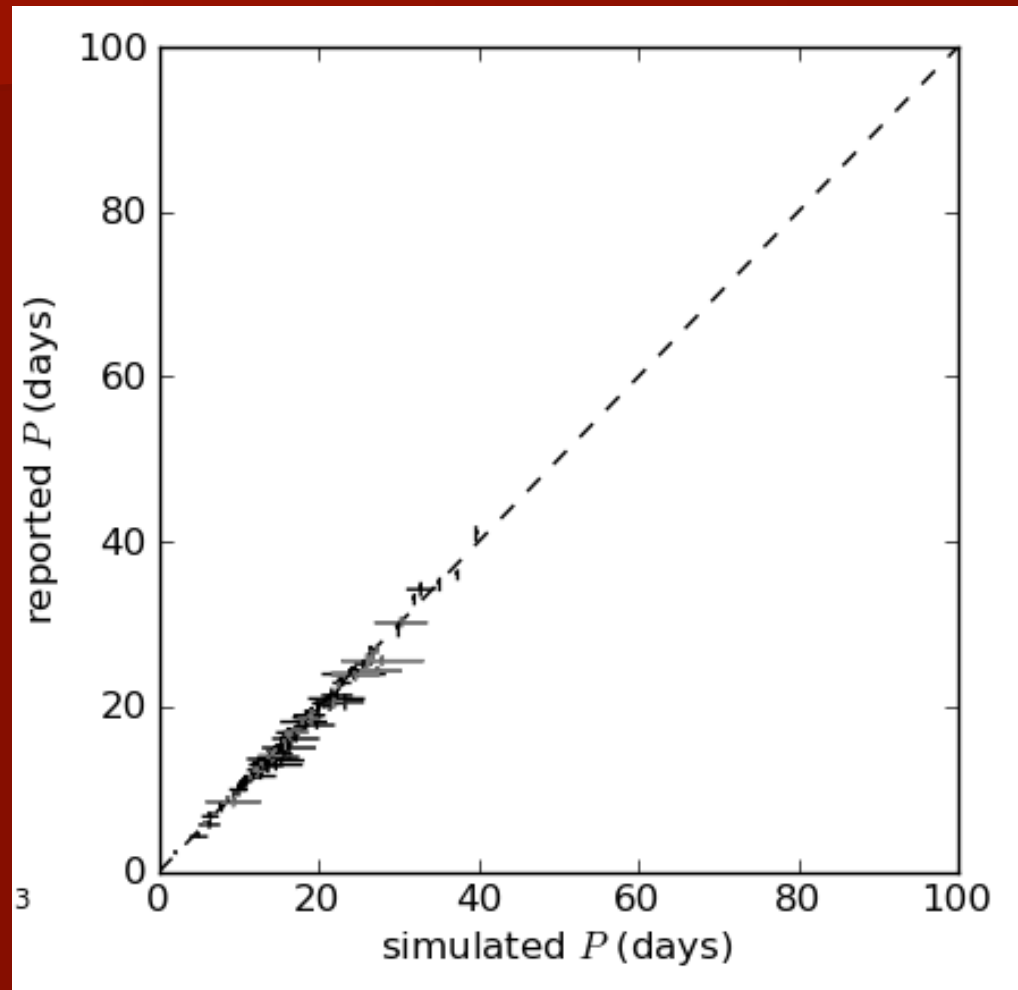


Comparison

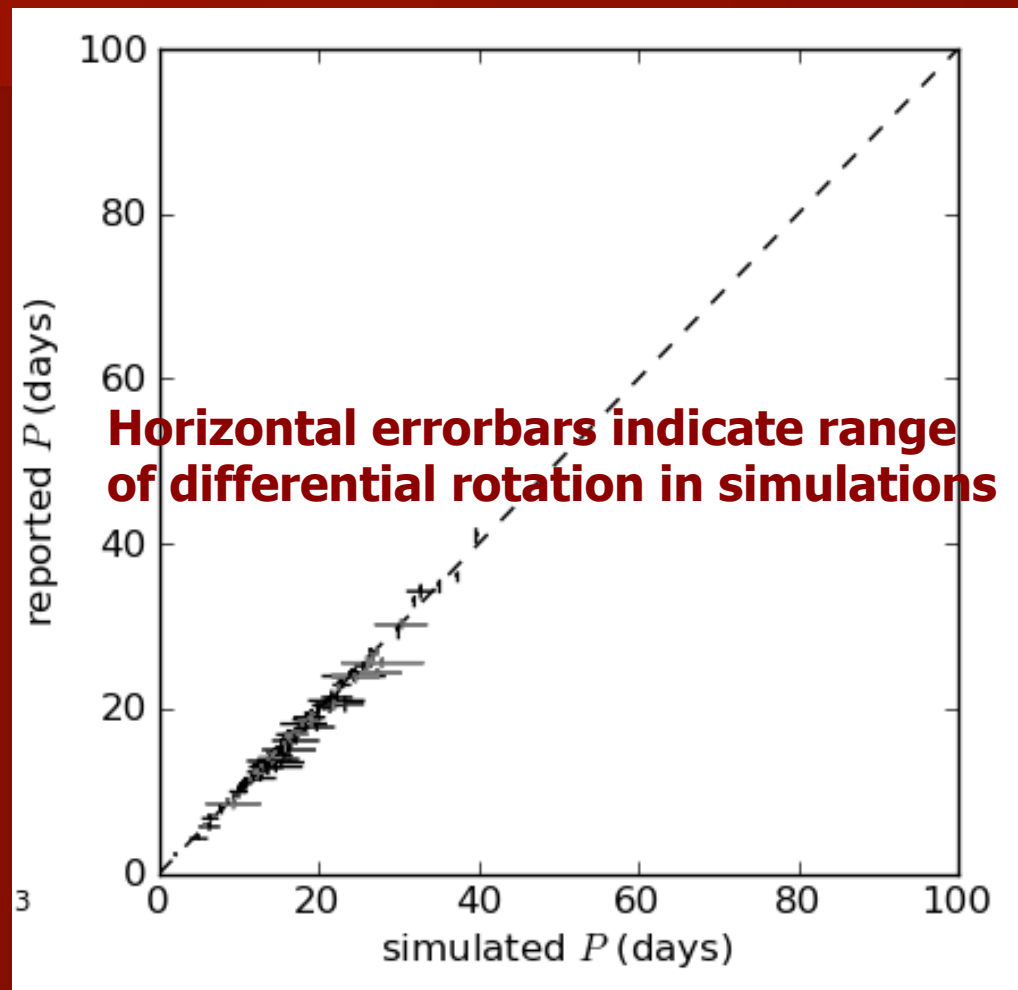


McQuillan et al (2014)

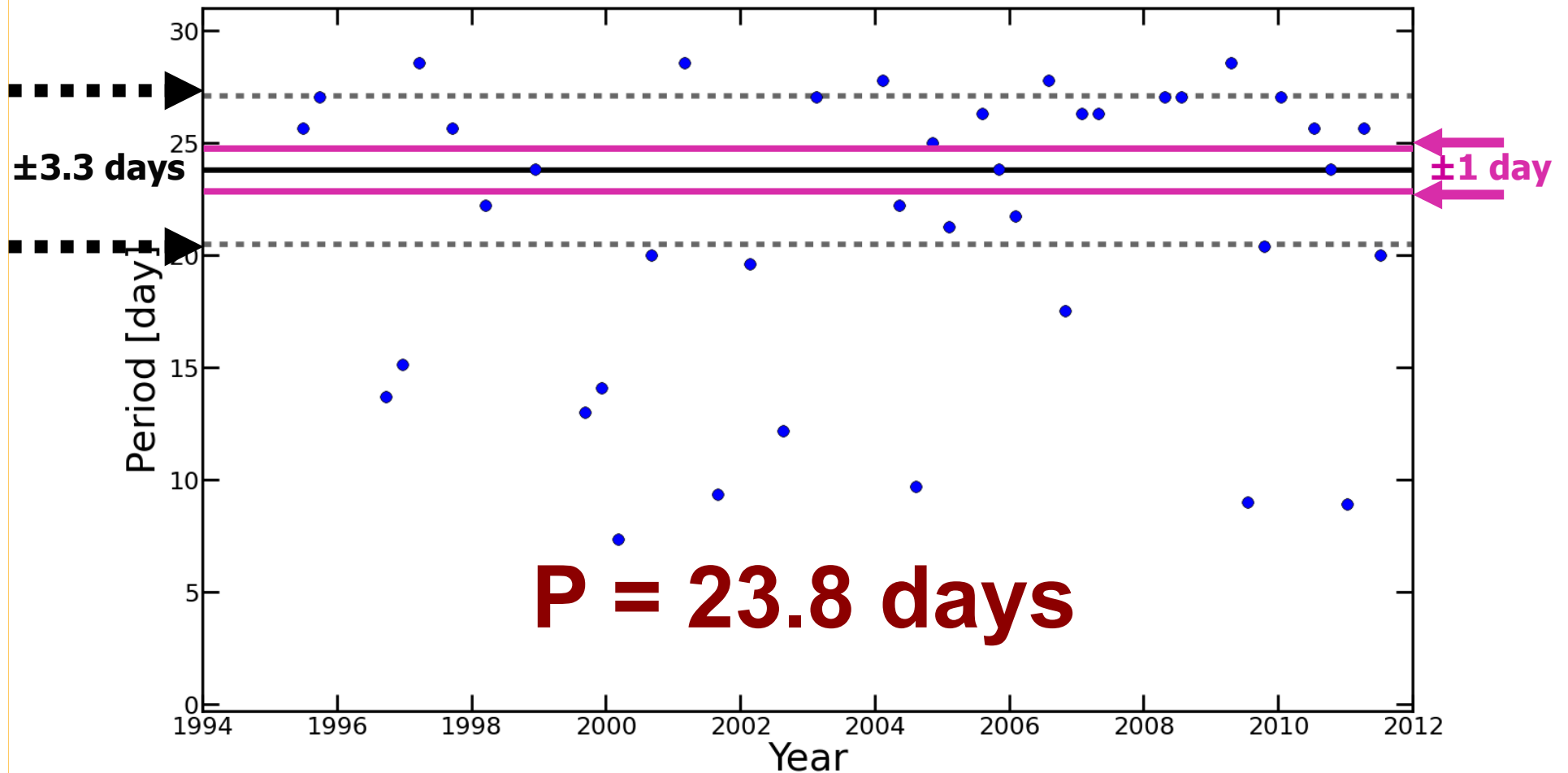
Hare-hound exercise



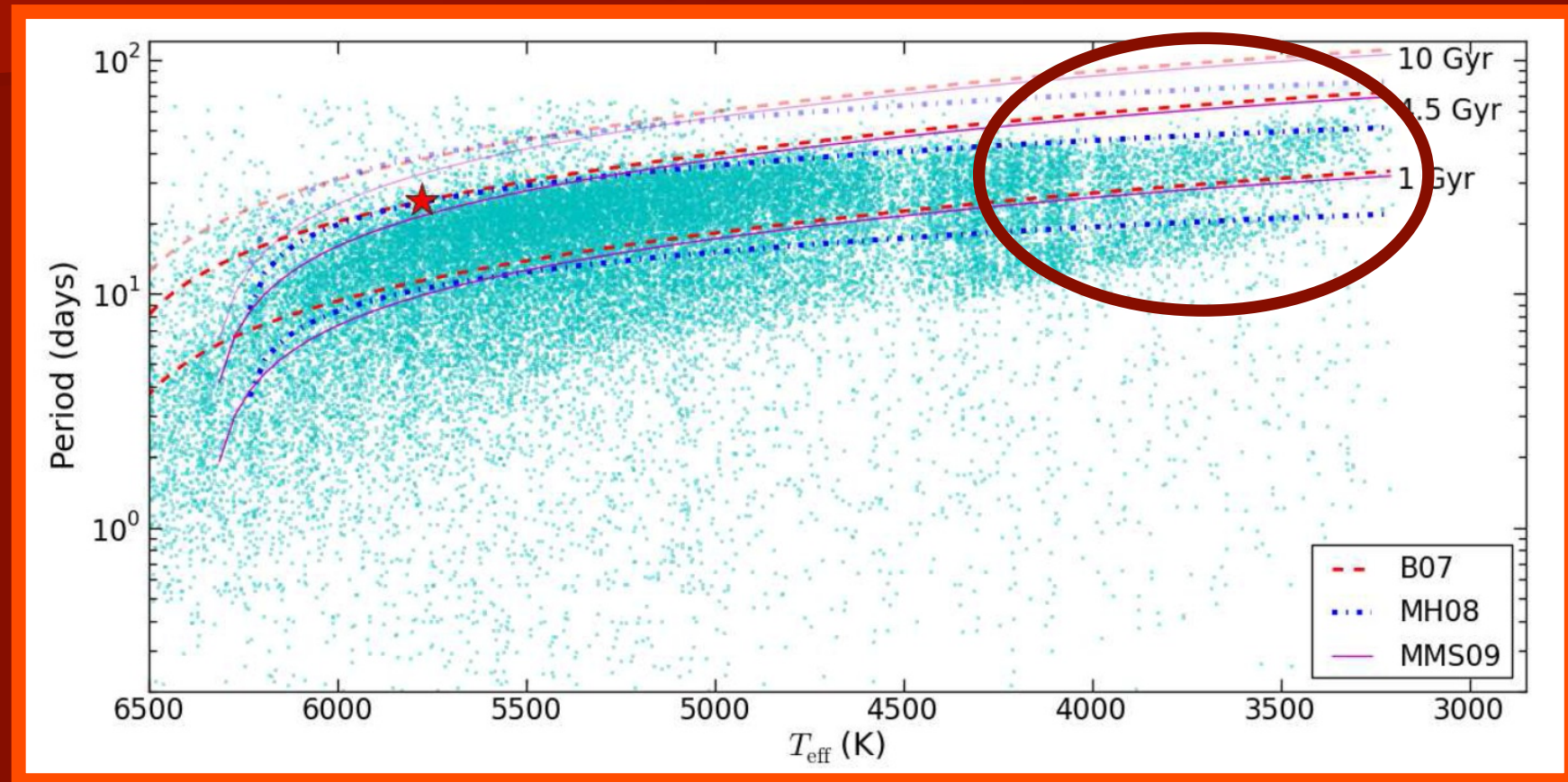
Hare-hound exercise



Testing the Sun with VIRGO Data



Application of the industrial approach



McQuillan et al (2014)

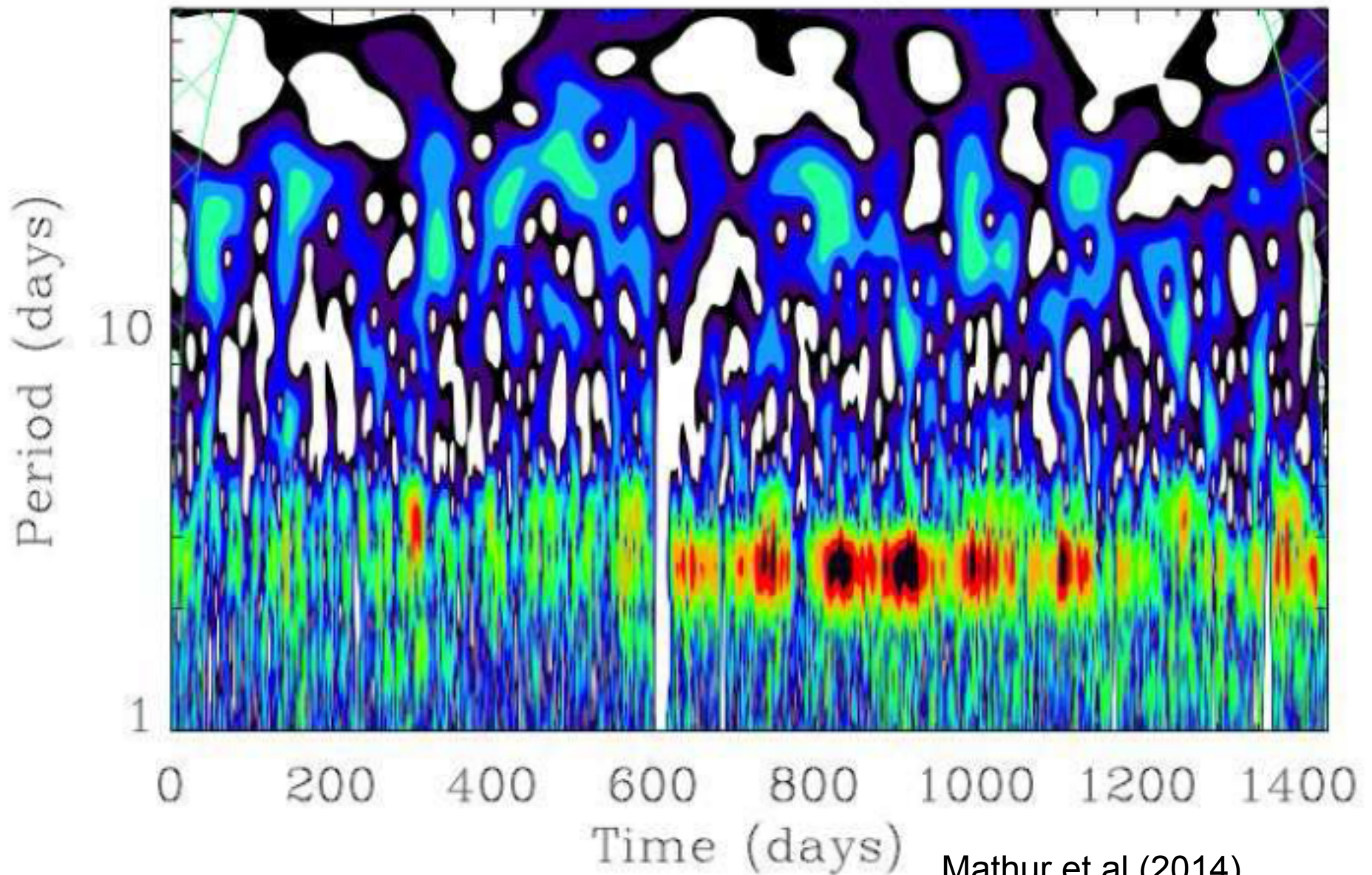
Case by case method

- Spot rotation can be used to constrain outer envelope rotation. (Hannah's talk).
- Automated methods pick up stars with clear spot signals.
- Case by case study of stars is necessary.

Case by case method

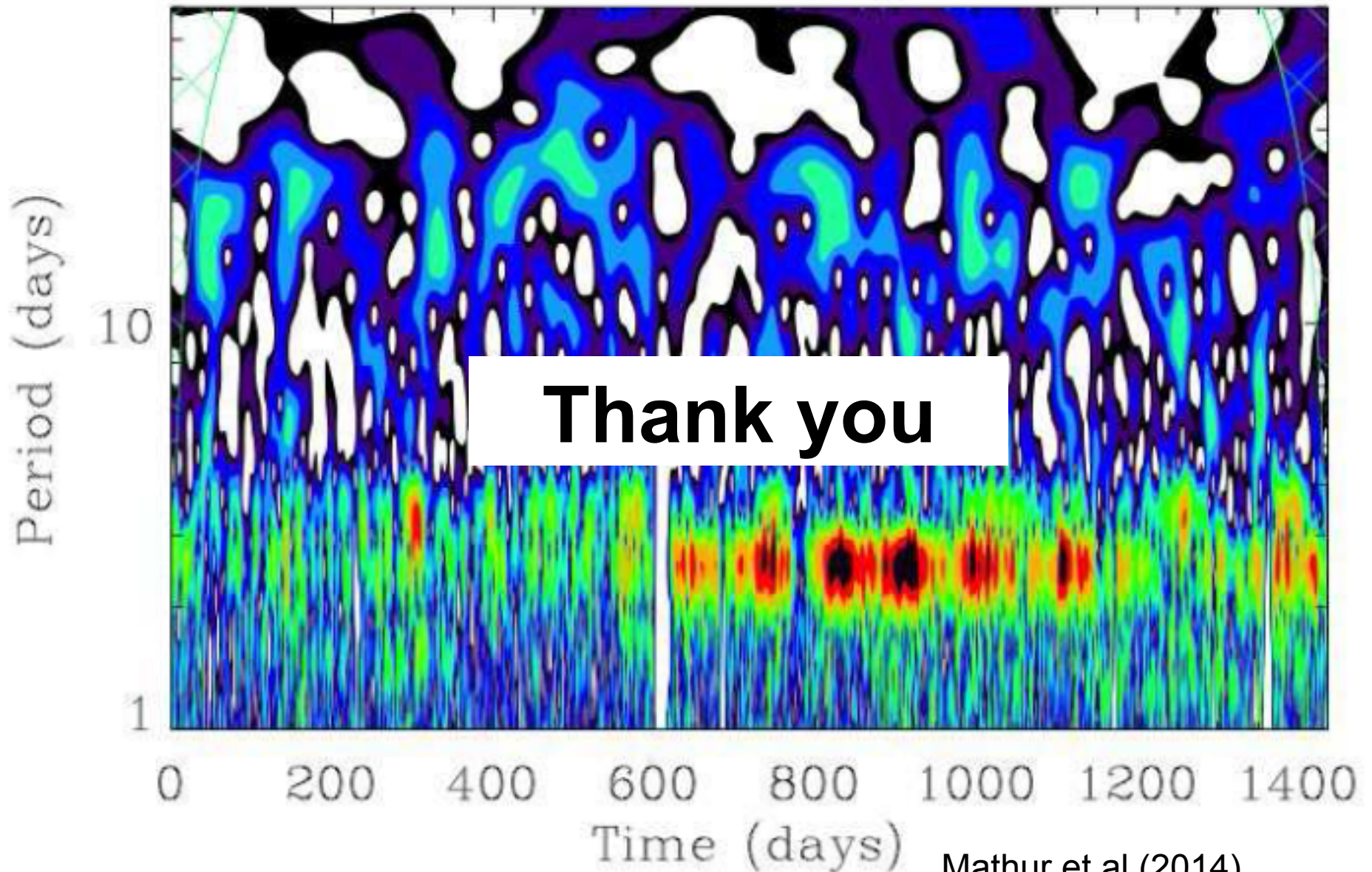
- The previously shown methods may still work.
- But supervision is required!
- In addition: Time frequency analysis using wavelets.

Wavelet Power Spectrum



Mathur et al (2014)

Wavelet Power Spectrum



Mathur et al (2014)