WEAKENED MAGNETIC BRAKING SUPPORTED BY ASTEROSEISMIC ROTATION RATES OF *KEPLER* DWARFS

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INTRO

- The **rotation** of stars **slows down** as they **age**, at a rate that is a function of **colour**.
- We can calibrate this **'gyrochronology'** relation to help us estimate stellar age.
- van Saders+16 showed that some **old stars** stop slowing down at a certain point. This effect is referred to as **weakened magnetic braking**.
- Asteroseismology can provide **independent rotation rates** to test this hypothesis at all ages (up to 12.8 Gyr in our sample).

METHOD

- We use the **Davies+16, Lund+17, Silva Aguirre+15,17** samples for their ages and locations of individual mode frequencies.
- We obtain **new** rotation periods for **91 stars** by fitting a holistic model to modes of oscillation, treating the mode frequencies as **latent variables**.
- Using a **hierarchical mixture model**, we compared our samples to two population models in mass, temperature, **age**, **rotation** and **metallicity**.

RESULTS

- Our sample **strongly favoured** the model where **weakened magnetic braking takes place**, over one where it doesn't. **[Figure 1]**
- We also **validated** seismic rotation rates by **comparing** them to **spot rotation** rates, and found they agreed. **[Figure 2]**

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asteronomer.com
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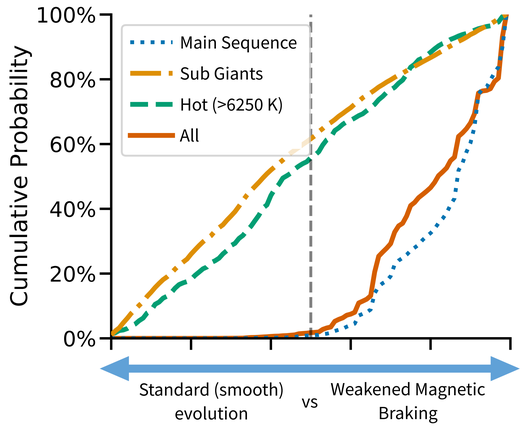
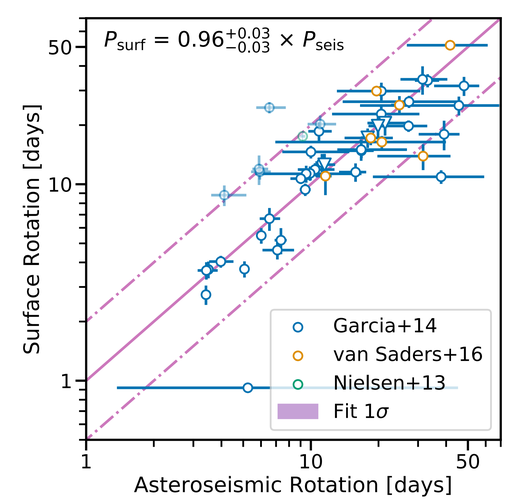
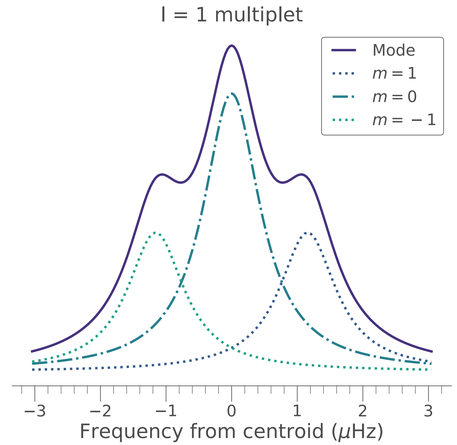
Rotation **slows less** on **late main sequence** than thought, seen through **vibrations**





ROTATIONAL SPLITTING

- The **rotation** and **inclination** of a star change how asteroseismic modes of oscillation appear.
- The **unique shape** of the modes lets us measure **both** rotation and inclination **simultaneously**!



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