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With modifications by David W. Hogg and Daniel Foreman-Mackey

ROTATING STARS FROM *Kepler* OBSERVED WITH GAIA

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ABSTRACT

Rotating stars. overlap between samples

1. INTRODUCTION

of course, Kepler useful for calibrations for Gaia, e.g. log(g) (**?**)

two period distribution found for M dwarfs in **?**, confirmed in up to K dwarfs **?** for full

Kepler mission (**?**)

the Gaia mission (**?**), Data Release 1 (**?**)

2. THE *Kepler*–GAIA DATA

using CDS X-Match service, we match the catalogs from

3. SELECTING MAIN SEQUENCE STARS

first we create the HR diagram, using the absolute Gaia magnitudes from the TGAS parallaxes, and the temperatures reported from McQ14

4. EXTENDING THE SPIN-DOWN GAP

this feature first observed in rotation period by **?** for M dwarfs

here we show it appears to extended to nearby higher mass stars in the *Kepler* field.

the reason this feature did not appear in earlier *Kepler* studies is the inability to select main sequence stars from turn-off or subgiants using the KIC

5. DISCUSSION

gaia useful for dtrrmining the age distribution of the nearby field have shown utility for using Gaia data, combined with detailed light curve statitiscs from kepler, to reveal hidden structure in properties of field stars

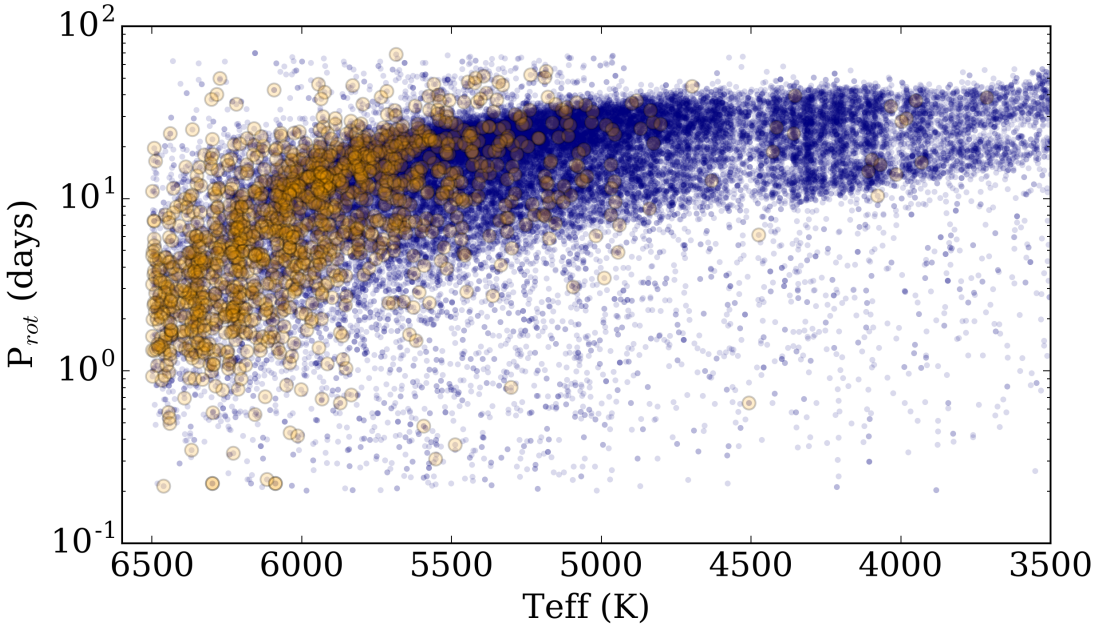

Figure 1.

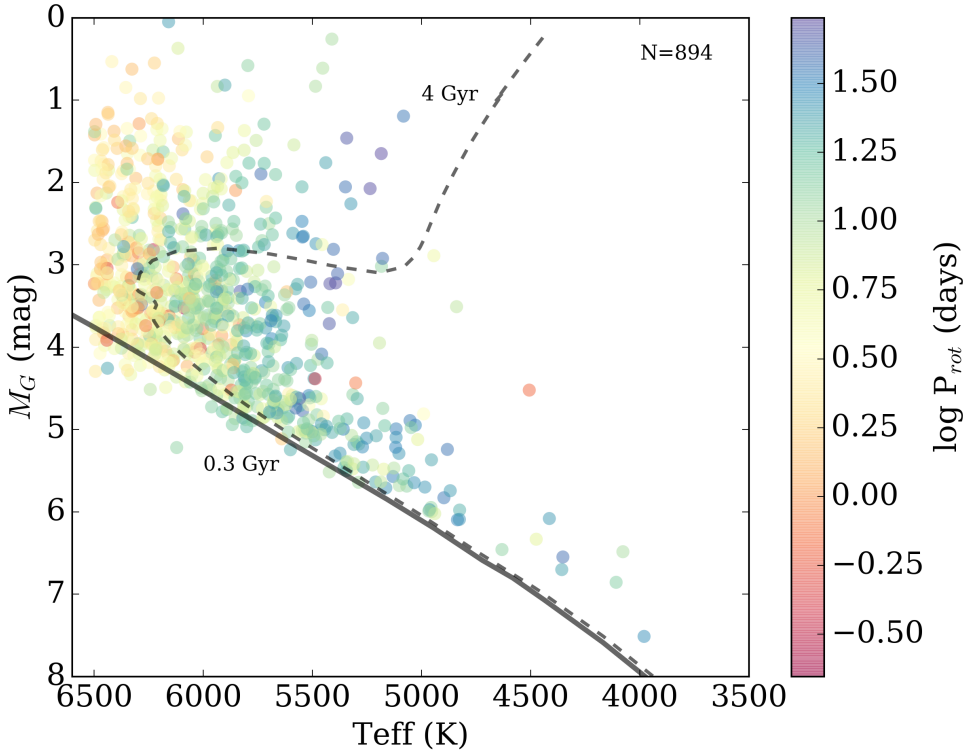

Figure 2. isochrones from **?**

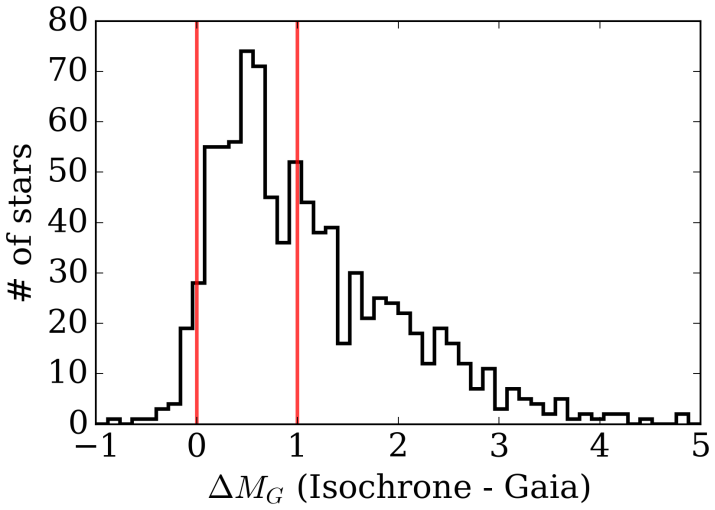

Figure 3.

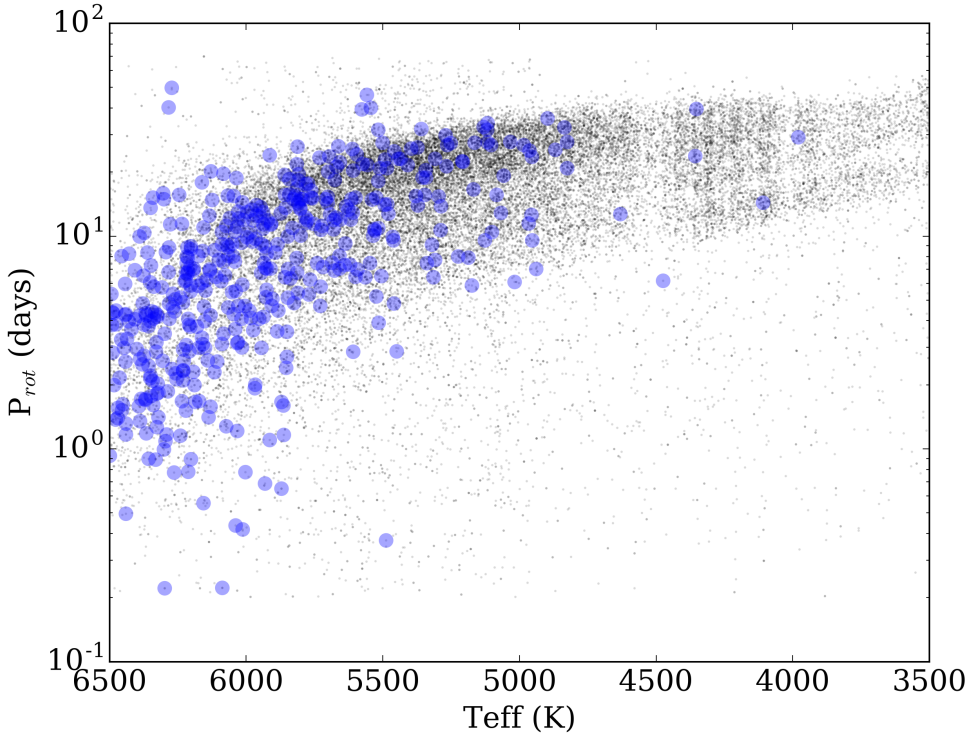

Figure 4.

the bimodality may be another manifestation of the "Vaughan Preston gap" (**?**), e.g. discussed for rotating stars by**?**. either due to fast evolution thorugh intermediate stellar activity, or could be an age gap.

another way the full Gaia release could further contribute to this mystery is to model the star formation history of the stars in the *Kepler* field, as well as the whole Milky Way (e.g. **?**). this will help A) improve gyrochronology relations by selecting only main sequence stars, and B) independently constrain age distribution for rotating stars to see if this gap is confirmed.

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