Binary fraction of magnetic chemically peculiar stars

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What are chemically peculiar stars?

- Upper Main Sequence: B- to early F-type stars
What are chemically peculiar stars?

- Works only with "low" rotational velocity
Low rotational velocity

- Mixing wins over diffusion for $v > 100$ km/s
CP stars in spectroscopic binary systems

• Non-magnetic subgroups
  1. CP1 (Am/Fm) stars: almost no single stars known from a sample of 4300 objects
  2. CP3 (HgMn) stars: at least 2/3 are in SB2 systems from a sample of about 170 objects

• Magnetic subgroup
CP stars in spectroscopic binary systems

• Magnetic subgroup

• There is no system known with an orbital period less than 1.5d
CP stars in eclipsing binary systems

HD 66051: the first eclipsing binary hosting an early-type magnetic star

O. Kochukhov, C. Johnston, E. Alecian, G. A. Wade and the BinaMlcS collaboration

See poster: Paunzen et al.

HD 99458: First time ever Ap-type star as a δ Scuti pulsator in a short period eclipsing binary?


See poster: Skarka et al.
CP stars in eclipsing binary systems

Figure 5. The KEELT light curves of the eclipsing binaries HD 244391, HD 247441, HD 248784 and HD 252519, folded on the orbital periods of, respectively, $P_{\text{orb}} = 6.0783(4)\, \text{d}$, $P_{\text{orb}} = 4.26756(5)\, \text{d}$, $P_{\text{orb}} = 0.81821(1)\, \text{d}$ and $P_{\text{orb}} = 3.07948(2)\, \text{d}$.

Bernhard et al., submitted
What needs to be done?

- Search for **EBs** in CoRoT, Kepler, and TESS with a **primary** on the **upper main sequence** and **spots**
- Search for **short orbital spectroscopic binaries** with a magnetic CP component
- Spectropolarimetric measurements of known systems to find new magnetic CP components
Thank you for your attention