**Rachael Roettenbacher: Continuing the stellar activity revolution with space based data.**

Fields form at base of convective zone, magnetic fields wrap around surface due to differential rotation. Sunspots form where field is perpendicular to surface.

RS Canum Venaticorum. Binary with giant primary, ms secondary. Shows photometric and calcium variability.

Roettenbacher et al. in prep., keep an eye out.

Lightcurve inversion onto a surface, roettenbacher et al. 2013. The spots appear to move over time, up and down in latitude.

Each latitude band, cross correlate with the next surface.

The rotation is different based on latitude, as inferred from the spots, and should all follow the same trend for all inclination angles.

Trying to find a correlation between spot size and flare strength. Largest spots give the most flares and strongest flares (in solar like stars).

Flares in a timeseries ruins the inversion. Removing them by hand brought the realization the flares happened when the spots were facing Kepler. When the spot is facing kepler, it is at its darkest. The strongest flares happened when the spot or part of the spot group was facing Kepler.

Github.com/vidakris/flatworm

Applied to spotted, flaring Kepelr stars. Developed new algorithm. If there were multiple spot gropus, no way to tell which one the flare is associated with.

Github.com/rmroettenbacher/sauces.

She finds a correlation between flares and spot location. We also kinda see this on the sun. Main sequence stars see this too, Maehara+2017, Roettenbacher+Vida 2018. M Dwarves do not, Hawley +14, Doyle+18.

There’s lots of place for work in stellar activity with TESS. More studies of starspot evolution, longevity and differential rotation. Improved understanding of stellar activity across the HR diagram. But really helps synergy with ground based stuff, interferometry etc.

Rachael interested in simultaneous imaging with Zeeman, CHARA interferometry.

**Angela Santos: Rotation and activity of Kepler stars**

Their lightcurves are obtained from KADACS. Passing 3 different lightcurves for each star, with a 20day, 55day, 80day filter. Perform in-painting techniques, corrects outliers jumps and drifts. The filters are important so that we don’t detect the harmonic of the rotation.

Santos et al+submitted, detection raction of rotation > 60%, within 5sigma of the mcquillan et al results.

Compared to the PDC-MAP lightcurves, the distribution of period rotation for the exact same stars is different. The KADACS lcs shift towards longer totation periods.

1221 new red giants. Rotation and Sph estimates for 60% of the sample. 44431 new rotation periods. Rotation period decreases with Teff and mass. See Poster 34.