The PolarBase archive of stellar spectra

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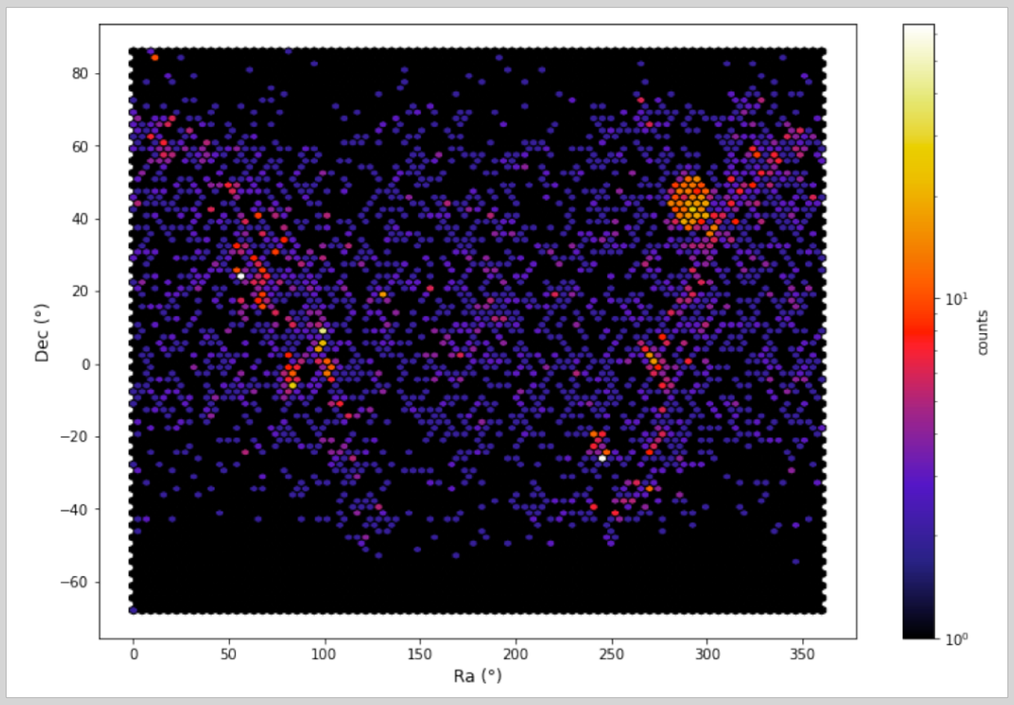
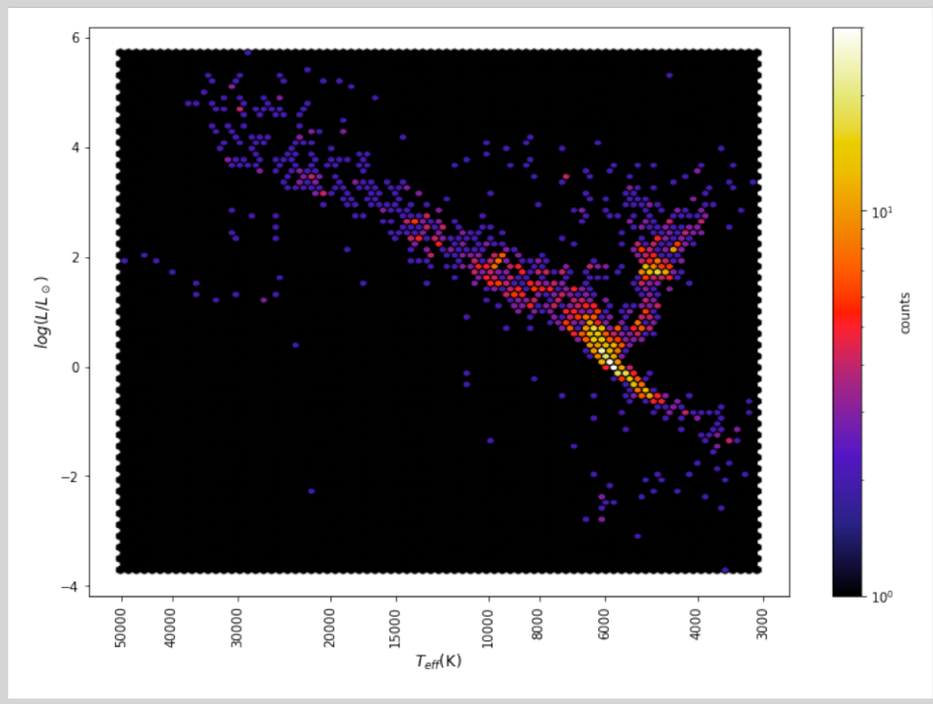
ABSTRACT - PolarBase is an online archive offering stellar data collected with the ESPaDOnS and NARVAL high-resolution spectropolarimeters, in their reduced form. All spectra feature a continuous coverage of the 370-1,000 nm spectral domain, at a spectral resolution of 65,000. As of 2022, observations of 4,700+ stellar objects throughout the Hertzsprung-Russell diagram are available for a total of more than 2x105 spectra. Intensity spectra are offered for all targets, and the majority of the observations also include simultaneous spectra in circular or linear polarization. Most observations are associated with a cross-correlation profile, significantly increasing the detectability of weak polarized signatures. Stokes V Zeeman signatures are detected for about 500 stars of all masses and evolutionary stages, and linear polarization is detected in a few dozen targets. This unique set of Zeeman detections offers the first opportunity to run homogeneous magnetometry studies throughout the H-R diagram. The web interface of PolarBase is available at **http://polarbase.irap.omp.eu**.

Quick facts about PolarBase:

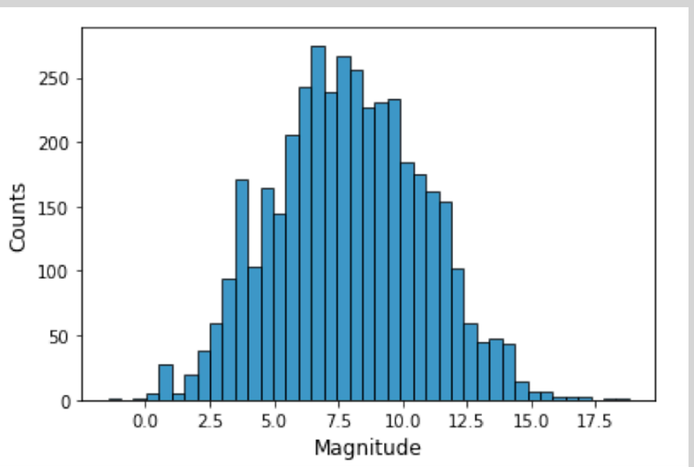
- 4,700 stars
- Spectral types: M8 to O2
- Wavelength: 370 nm to 1,000 nm
- Spec. resolution: 65,000
- RV stability: 20-30 m s^{-1}
- **Reference: Petit+ 2014, PASP 126, 469**

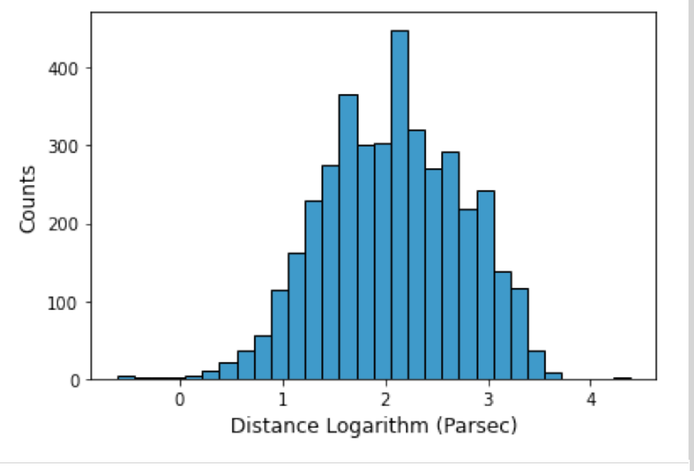


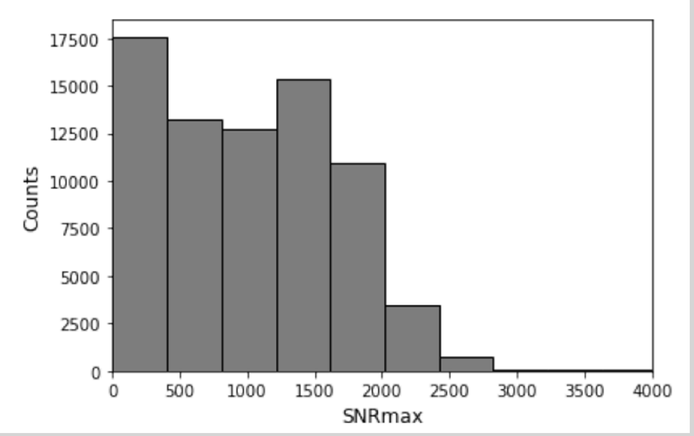
PolarBase stars in celestial coordinates. The Milky Way is visible as a U-shape. The KEPLER field is the dense accumulation of targets in the upper right quadrant.



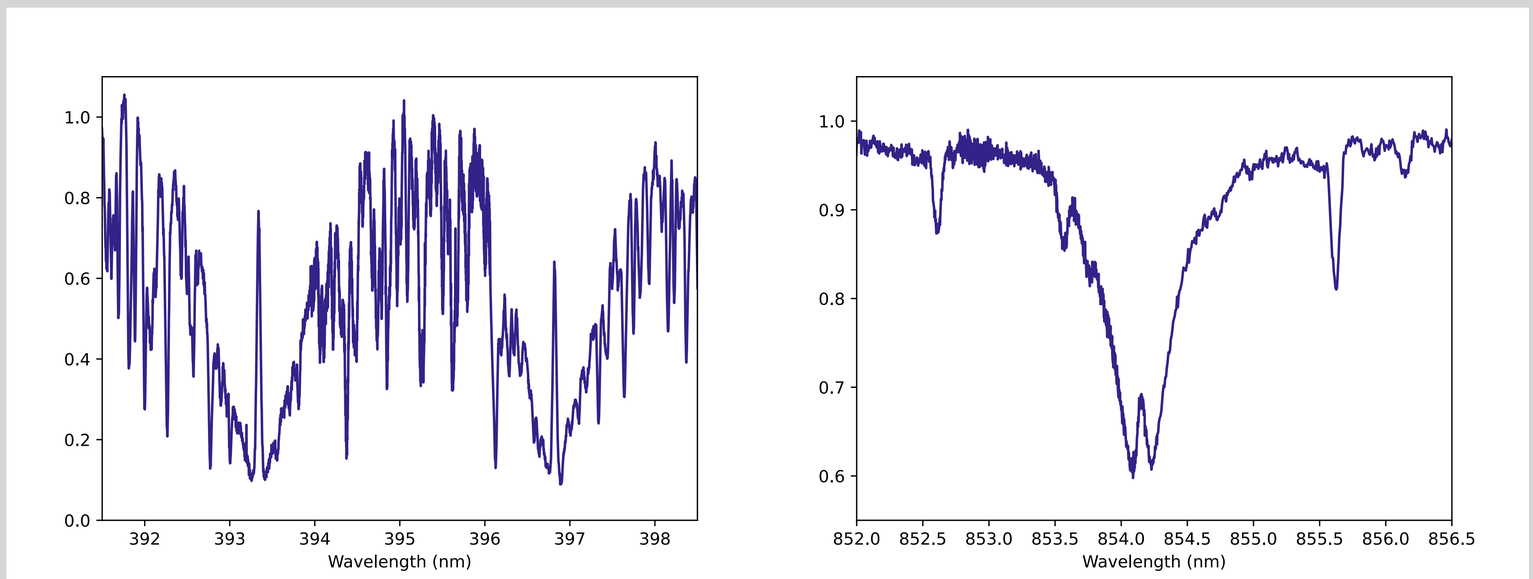
PolarBase targets in the Hertzsprung-Russell diagram. The most populated part of the diagram is for solar analogues, but spectral types go from M8 to O2. Young stars and evolved stars are also well represented.



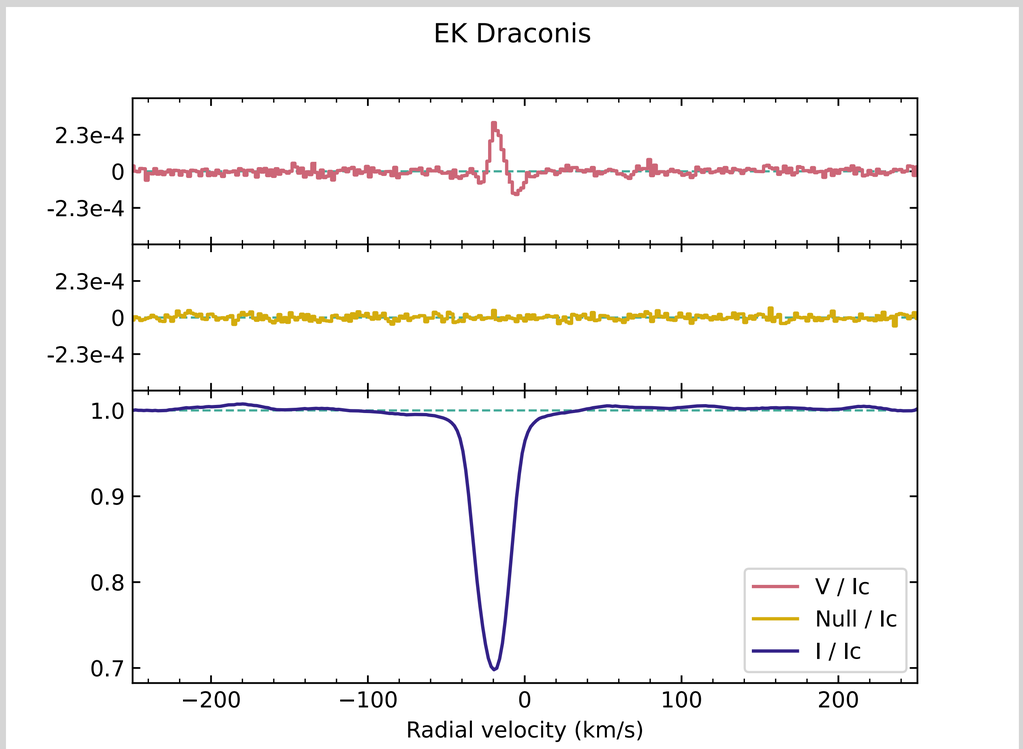




Top: distribution of visual magnitudes. Middle: distribution of stellar distances. Bottom: distribution of S/N (in the center of the spectral order where it is maximal). Note that close to 50% of observations benefit from a S/N greater than 1,000.



Zoom on selected spectral regions of an observation of the active Sun-like star EK Draconis (normalized intensity). Left: the CaII H&K doublet. Right: one line of the CaII IR triplet.



Cross-correlation profile for an observation of the active solar analogue EK Draconis. Top: circular polarization. Middle: « null » profile (control parameter supposed to display pure noise). Bottom: Intensity profile.