

Giant planets around young active stars

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CONTEXT

The origin of **short-orbit gas giants** exoplanets is still debated. Insight could be gained from constraining their occurrence at a young age (< 150 Myr), but probing young stars is difficult as they exhibit strong stellar activity signatures. These signatures mimic and mask traces of hidden exoplanets. Efficiently filtering/removing this activity is crucial to hope to unravel these peculiar exo-worlds.

METHOD

We hid 37 single circular planets behind existing spectra of the young active star HD 141943. We attempted to recover the planets buried in the strong activity signatures using two distinct filtering strategies:

Doppler Imaging & **Gaussian Processes**

With a low number of epochs & low precision ($\sigma_{RV} \approx 70 \text{ m.s}^{-1}$), we recovered planets ~ 5 times below the activity level ( on plot).

Recovering orbital periods close to stellar equatorial period & harmonics is difficult.

( on plot)

Using Rigorous Bayesian inference (through the Gaussian process) should be privileged over classical false-alarm probability levels.

We will now search for planets in RV datasets acquired in the context of stellar surveys and use TESS photometry to better characterise the activity.

Simulated planets hidden behind HD 141943's activity (Heitzmann et al. 2021, in review)

