

HEARTS VIII. High-resolution transmission spectroscopy of KELT-10b

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Non-detection of sodium in the atmosphere of KELT-10b.

TLDR summary:

- Target: KELT-10b
 - KELT-10b is a similar "twin" planet of HD 209458 b, only further from Earth (thus orbiting fainter star)
 - There is almost no publications regarding this planet, main ones include:
 - [Kuhn et al. 2016 - discovery_paper](#)
 - [McCloat et al. \(2021\) - sodium detection with UVES](#)
- Data used:
 - HARPS dataset (2 transit, 96 spectra) with complementary EULER ECAM light-curves (RG band)
 - Additional CORALIE dataset for RV orbit
- Transmission spectroscopy of Na and $H\alpha$ - **non detection of both**
 - This is compatible with sodium detection in [McCloat et al. \(2021\)](#).
- RM analysis
 - **KELT-10b is aligned with stellar rotation plane**
 - **RM induces strong effect on the transmission spectrum, potentially explaining the detection in [McCloat et al. \(2021\)](#).**
- Photometry
 - CONAN analysis for ephemeris refinement, using jointly data from [Kuhn et al. 2016](#)
 - The observed ephemeris is compatible with [Kuhn et al. 2016](#)
 - Improved T_C and P due to longer baseline