SPIRou meets ARIEL

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SPIRou OVERVIEW

SPIRou (SpectroPolarimètre Infra-Rouge) is an innovative and challenging near IR high-resolution spectropolarimeter, and high precision velocimeter.

Main science aims
- The search of Earth-like planet around M-dwarfs;
- The study of the magnetic field role on stars / planets formation

Overview of the main SPIRou sub-systems: (1) the Cassegrain unit (2) the spectrograph enclosure in its cryostat; (3) the Calibration module.

Spectral range: 0.96 – 2.48 μm in a single exposure, no gaps, YJH and K bands 49 orders

Example of a reduced blaze-corrected Stokes I spectrum obtained for HD189733 in September 2018. The beginning of each diffraction order is indicated through a magenta vertical dotted line and the Y, J, H and K bands are shown as the horizontal dashed lines on the top. The green vertical bands indicate the spectral ranges dominated by tellurics.

Spectral resolution: 70±5K
Radial velocity precision: 2 m.s⁻¹

Example: cross correlation of high resolution simulated spectrum of HD 189733b with water lines
Expected 4 sigma detection of water

Klein et al. in prep

CONCLUSIONS
- High resolution spectropolarimeter installed at CFHT
- Current radial velocity precision : 2m/s

Combination with ARIEL:
- Higher resolution spectrum in the near infrared
- Possibility to filter out stellar activity

Complement:
- 2021: SPIP – SpectroPolarimètre Infrarouge Pic du midi, France

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