OBSERVATIONS OF THE ZEEMAN/PASCHEN-BACK EFFECT IN THE A-X SYSTEM OF CrH

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We present our investigations of the magnetic response of $A^6\Sigma^+ - X\,^6\Sigma^+$ transitions in CrH, in fields up to 0.5 Tesla, focusing on the strong dissymmetry between σ^+ and σ^- transitions, observed as predicted[a] at modest magnetic field strengths. This dissymmetry is recorded as Stokes V signals in telescope spectropolarimetry, where it gives a sensitive probe of stellar magnetism. CrH (and FeH) bands feature prominently in spectra of cool dwarf stars taken for example on the SPIRou spectropolarimeter (searching for exoplanets at the Canada-France-Hawaii telescope). Ultimately, our work should help to discriminate effects of stellar magnetism from exoplanet presence in radial velocity data derived from telescope spectropolarimetric measurements.

Field-free line positions are well-documented[b] for the 760 and 870 nm bands of the *A*–*X* system. IR laser magnetic resonance studies[c] provide some ground state Landé factors, but the Zeeman effect has been investigated for only the lowest rotational levels of the *A* state, under molecular beam conditions[d]. To extend these observations, we have recorded cavity-enhanced absorption data (providing relative intensities in zero field conditions) and laser-induced fluorescence spectra using circularly polarised light, with a discharge source producing CrH at around 500 K.

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