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Characterization of a green astro-comb using a Fourier Transform Spectrometer ALEXANDER GLENDAY, CHIH-HAO LI, Harvard-Smithsonian, MATTHEW WEBBER, Northeastern University, NICHOLAS LANGELLIER, GABOR FURESZ, Harvard-Smithsonian, GUOQING CHANG, LI-JIN CHEN, HUNG-WEN CHEN, JINKANG LIM, FRANZ KAERTNER, Massachusetts Institute of Technology, DAVID PHILLIPS, ANDREW SZENTGYORGYI, RONALD WALSWORTH, Harvard-Smithsonian — Searches for Earth-like exoplanets using precision stellar radial velocity (PRV) measurements require a precision and accuracy below 10 cm/s over several years. An astro-comb, the combination of a laser frequency comb with a coherent wavelength shifting mechanism (such as a doubling crystal or photonic crystal fiber) and a mode-filtering Fabry-Perot cavity (FPC), produces evenly spaced frequency markers with broad spectral coverage and is a promising approach to improved wavelength calibration for astrophysical spectrographs. The accuracy of an astro-comb relies on high-quality suppression of undesired comb lines by the FPC. Here we present a characterization of a green astro-comb using a high-resolution Fourier Transform Spectrometer (FTS) constructed in our laboratory. The FTS has an unapodized resolution of 125 MHz, which enables high resolution measurements of our 1 GHz repetition rate laser frequency comb after it has been filtered into a 20 GHz astro-comb. FTS measurements of the green astro-comb will reveal any systematic defects in our filtering process and help determine the ultimate accuracy of the astro-comb as a wavelength reference.

Chih-Hao Li
Harvard-Smithsonian

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