

Abstract Submitted
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Green astro-comb for exoplanet searches CHIH-HAO LI, ALEXANDER GLENDAY, NICHOLAS LANGELLIER, GABOR FURESZ, Harvard-Smithsonian, MATTHEW WEBBER, Northeastern University, GUOQING CHANG, LI-JIN CHEN, HUNG-WEN CHEN, JINKANG LIM, FRANZ KAERTNER, Massachusetts Institute of Technology, DAVID PHILLIPS, ANDREW SZENTGYORGYI, RONALD WALSWORTH, Harvard-Smithsonian — Astro-combs, a combination of a laser frequency comb, coherent wavelength shifting mechanism (such as a doubling crystal or photonic crystal fiber) and a mode-filtering Fabry-Perot cavity (FPC), are promising spectrograph calibrators, which will enable searches for Earth-like exoplanets and direct observation of the accelerating expansion of the universe. In this talk, I will present recent results from a green astro-comb, which will be integrated in 2012 with the HARPS-N spectrograph in the 3.6 m Telescopio Nazionale Galileo (TNG) in the Canary Islands. The green astro-comb consists of 6000 lines equally spaced by 20 GHz in the 500-600 nm optical band. The green astro-comb is generated from a 1-GHz Ti:Sapphire comb laser, a custom tapered photonic crystal fiber that spectrally shifts the comb lines to the visible, and two mode-filtering FPCs that increase the line spacing to be suitable for calibration of the R=100,000 HARPS-N spectrograph. We have also used a high-resolution Fourier Transform Spectrometer (FTS) to analyze systematic errors across the full green astro-comb spectrum. The current status of these investigations will be presented.

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