

Abstract Submitted
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Initial results from a green astro-comb for exoplanet searches at HARPS-N DAVID PHILLIPS, CHIH-HAO LI, ALEXANDER GLENDAY, NICHOLAS LANGELLIER, GABOR FURESZ, Harvard-Smithsonian Center for Astrophysics, GUOQING CHANG, Physics. Dept. Hamburg University and DESY and MIT, HUNG-WEN CHEN, JINKANG LIM, Massachusetts Institute of Technology, FRANZ KAERTNER, Physics. Dept. Hamburg University and DESY and MIT, ANDREW SZENTGYORGYI, RONALD WALSWORTH, Harvard-Smithsonian Center for Astrophysics — Astro-combs, a combination of a laser frequency comb, a coherent wavelength shifting mechanism (such as a doubling crystal and photonic crystal fiber), and a mode-filtering Fabry-Perot cavity, are promising tools that enable searches for Earth-like extra-solar planets (exoplanets) and the direct observation of the accelerating expansion of the universe. In this talk, We will present recent results from our “green astro-comb” that has been operating at the HARPS-N spectrograph in the 3.6 m Telescopio Nazionale Galileo (TNG) in the Canary Islands for the past year. The green astro-comb consists of ~ 6000 lines equally spaced by ~ 20 GHz in the 500 nm - 600 nm optical band and is derived 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 Fabry-Perot cavities that increase the line spacing to match the $R = 100000$ HARPS-N spectrograph. Results from initial investigations with the green astro-comb characterizing the performance of the HARPS-N spectrograph will be presented.

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