

Abstract Submitted  
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**Green Astro-comb for exoplanet searches** NICHOLAS LANGELIER, ALEXANDER GLENDAY, CHIH-HAO LI, 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, DAVID PHILLIPS, ANDREW SZENTGYORGYI, RONALD WALSWORTH, Harvard-Smithsonian Center for Astrophysics — Searches for extrasolar planets using the precision stellar radial velocity (RV) measurement are approaching Earth-like planet sensitivity. Astro-combs, which consist of a laser frequency comb, coherent wavelength shifting mechanism (such as a doubling crystal and photonic crystal fiber), and a mode-filtering Fabry-Perot cavity (FPC), provide a promising route to increased accuracy and long-term stability on the astrophysical spectrograph calibration. Here, we present the design of a green astro-comb from an octave spanning Ti:Sapphire laser, spectrally broadened by custom tapered PCF to the visible band via fiber-optic Cherenkov radiation for frequency shifting, and filtered by a broadband FPC, constructed by a pair of complementary chirped mirrors. Performance of this astro-comb in both the laboratory and at the HARPS-N spectrograph will be presented.

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