

Abstract Submitted
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Progress with a green astro-comb for exoplanet searches.

Type: poster. DAVID F. PHILLIPS, Harvard-Smithsonian Center for Astrophysics, CHIH-HAO LI, AOSense, Inc., ALEXANDER GLENDAY, Komodo Health, Inc., DIMITAR SASSELOV, ANDREW SZENTGYORGYI, RONALD L. WALSWORTH, Harvard-Smithsonian Center for Astrophysics — Searches for extrasolar planets using the precision stellar radial velocity (RV) measurement technique 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. We first 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. We also present results from three years of operation of the astro-comb calibrating the HARPS-N spectrograph at the Italian National Telescope on La Palma, Canary Islands, including its use in measurements of solar radial velocities as well as its use in searches for extrasolar planets.

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