Abstract Submitted
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**Red, Green, and Blue Astro-combs** DAVID PHILLIPS, ALEX GLENDAY, CHIH-HAO LI, SYLVAIN KORZENNIK, Harvard-Smithsonian CfA, GUOQING NOAH CHANG, LI-JIN CHEN, ANDREW BENEDICK, FRANZ KAERTNER, MIT, DIMITAR SASSELOV, ANDREW SZENTGYORGYI, RONALD WALSWORTH, Harvard-Smithsonian CfA — Searches for extrasolar planets using the periodic Doppler shift of stellar lines are approaching Earth-like planet sensitivity. Astro-combs, a combination of an octave spanning femtosecond laser and a mode-filtering cavity provide a likely route to increased calibration precision and accuracy. We present results from three astro-combs operating in the red/near-IR, green and blue spectral ranges. Light from a 1-GHz, octave-spanning Ti:Sapphire laser is filtered by a Fabry-Perot Cavity (FPC) constructed from Doubly-Chirped Mirrors to produce a red astro-comb with 100 nm of optical bandwidth. This astro-comb has calibrated an astrophysical spectrograph at the 1 m/s level. In the blue astro-comb, Ti:Sapphire comb light, doubled in a BBO crystal is filtered to 50 GHz mode spacing with an FPC. The blue astro-comb has performed 50 cm/s calibrations. In the "green" astro-comb, light from the 1 GHz Ti:Sapphire comb laser is broadened in a photonic crystal fiber optimized to produce light in the green. This 1-GHz spaced green light is then filtered to roughly 40 GHz via an FPC with zero group delay dispersion mirrors, providing approximately 50 nm of astro-comb light centered near 550 nm.

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