

Abstract Submitted
for the DAMOP11 Meeting of
The American Physical Society

Calibration of an Astrophysical Spectrograph with an Astro-comb in the Visible Spectral Range CHIH-HAO LI, ALEX GLENDAY, DAVID PHILLIPS, 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. To find a 1-Earth-mass planet in an Earth-like orbit, an order of magnitude improvement in state-of-the-art radial velocity spectroscopy is necessary. An astro-comb, the combination of an octave-spanning laser frequency comb with a Fabry-Perot cavity, producing evenly spaced frequency markers with the potential for large wavelength coverage is a promising avenue towards improved wavelength calibration. Here we demonstrate the calibration of a high-resolution astrophysical spectrograph below the 50 cm/s level in the visible spectral range around 420 nm using an octave-spanning Ti:Sapphire laser and an ultra-low dispersion Fabry-Perot filter cavity adjusted for a mode spacing of approximately 50 GHz. Modeling of spectrograph response function and overall system stability and reproducibility will be described.

David Phillips
Harvard-Smithsonian CfA

Date submitted: 03 Feb 2011

Electronic form version 1.4