

Name: Sara Gettel  
Email: sgettel@cfa.harvard.edu  
Institution: Harvard-Smithsonian Center for Astrophysics  
Title: Correcting Astrophysical Noise in HARPS-N RV Measurements  
Type: Poster  
Session: Stellar Activity, Rotation, Ages, Metallicity  
Abstract: Radial velocity instrumental precision has improved to the degree that measurements are now limited in part by the noise intrinsic to the host star, or stellar 'jitter'. Several different phenomena contribute to the observed jitter, including pressure waves, granulation, magnetic features caused by stellar activity, and solar-like magnetic cycles. The amplitude of these effects ranges from 10 to 400 cm/s, depending on stellar type, and pose a significant limitation to detecting Earth analogues. We carry out a survey of bright, quiet stars with the new HARPS-N instrument, an ultra-stabilized R=115,000 cross-dispersed spectrograph located on the 3.6m Telescopio Nazionale Galileo on the island of La Palma. We look for correlations between these radial velocity measurements and known activity indicators, including line bisector measurements and the CaII index. We also investigate the correlation between radial velocity measurements and variations in line depth ratios, which may be sensitive to temperature variations as small as 5K. By correcting for these combined effects, we can improve the radial velocity precision, enabling the detection of low-mass planets.