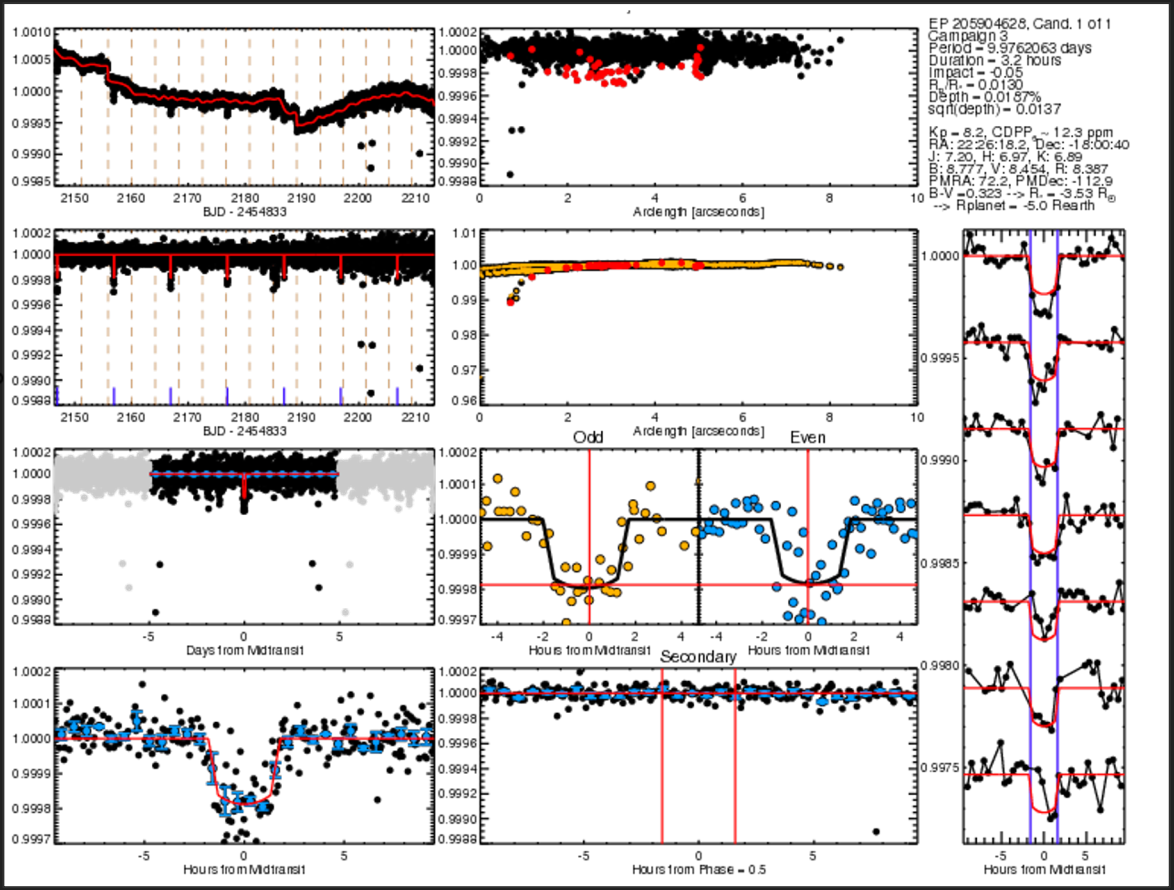
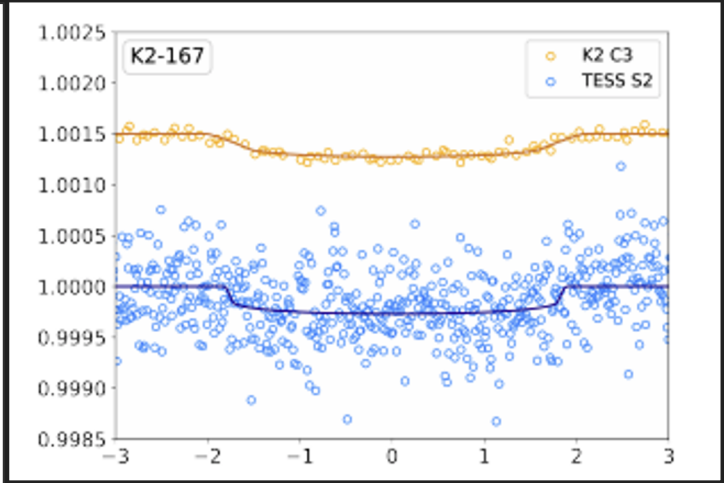
HD212657 (K2-167)

brightest star observed by Kepler
that hosts a validated planet



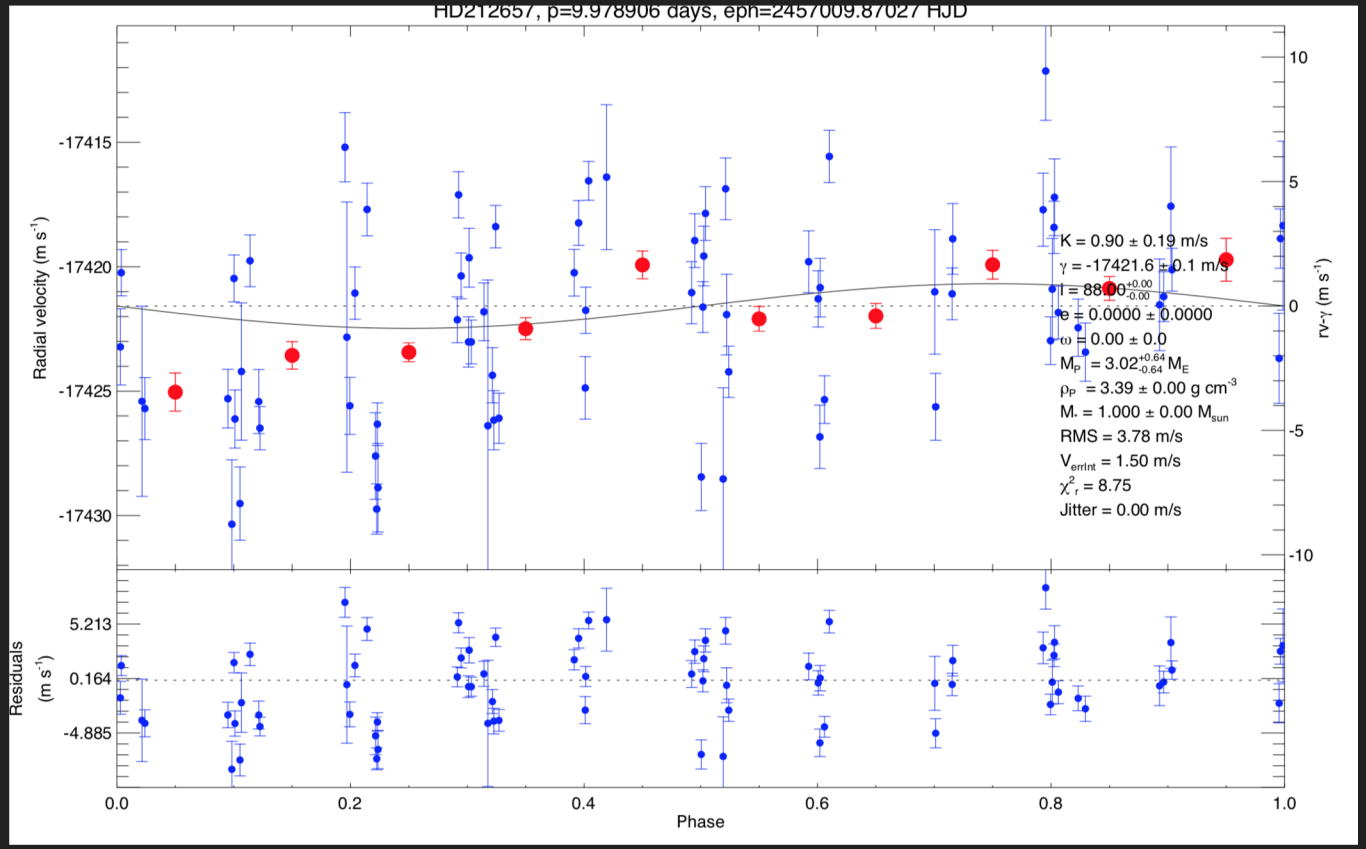


Ikwut-Ukwa et al. 2020

Updated radius with K2-TESS
Radius: 2.26+/- 0.016 R_{earth}

Vanderburg et al 2016; Validated in Mayo et al 2018

Observed with HARPS ~2015-16, but noisy

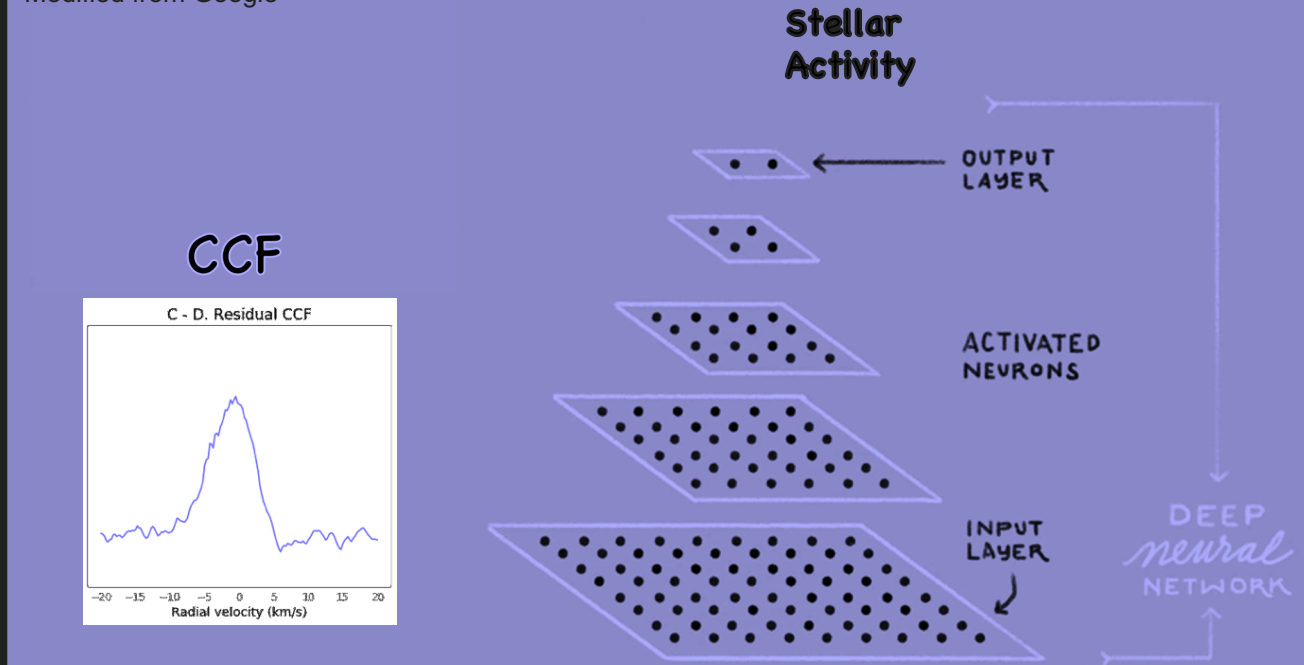


From Lars' website

Can we use some of the lessons we learned from HARPS-N Solar Data for HD212657?

We trained neural networks to predict and remove stellar jitter using only the ΔCCF (no timing information, no activity indicators)

Modified from Google



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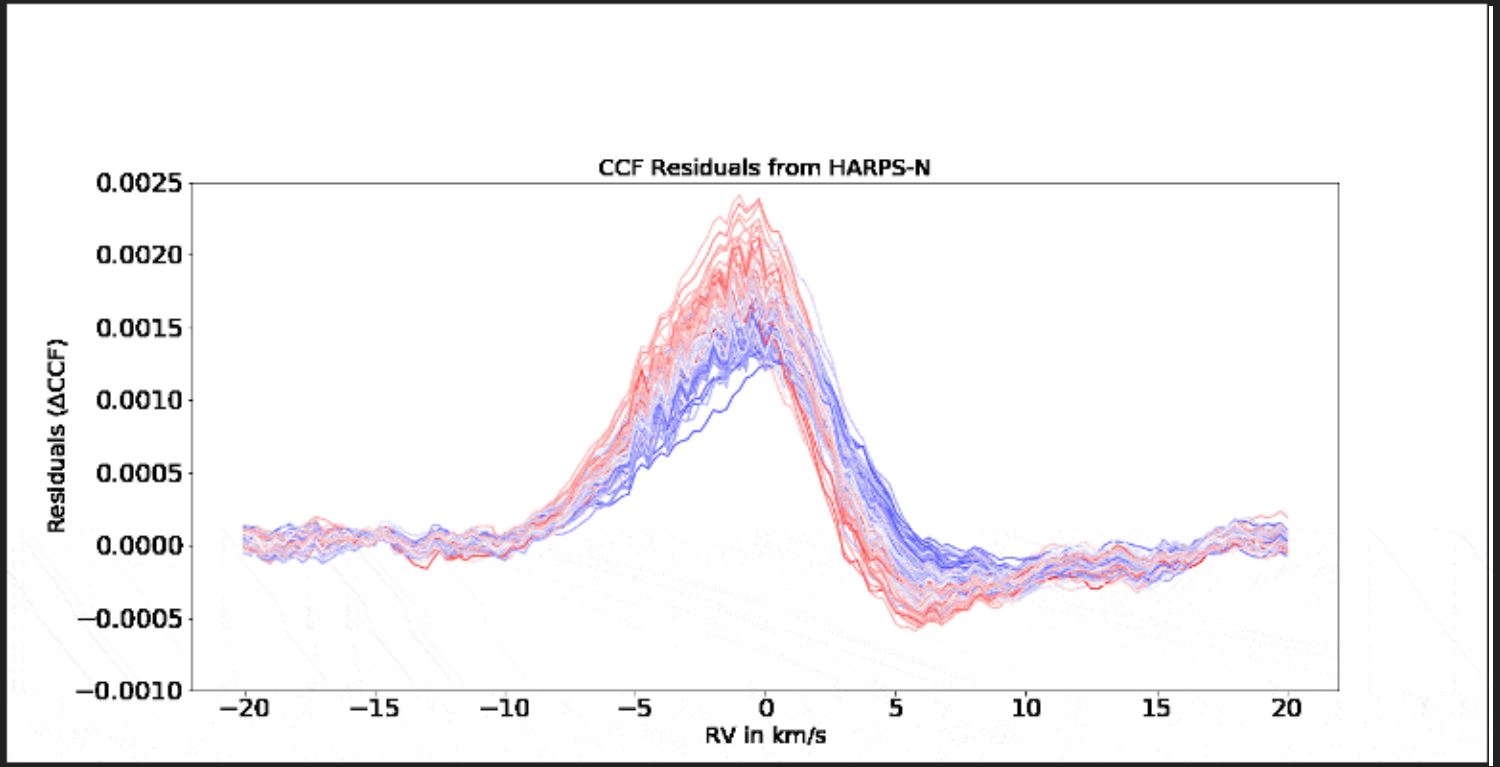
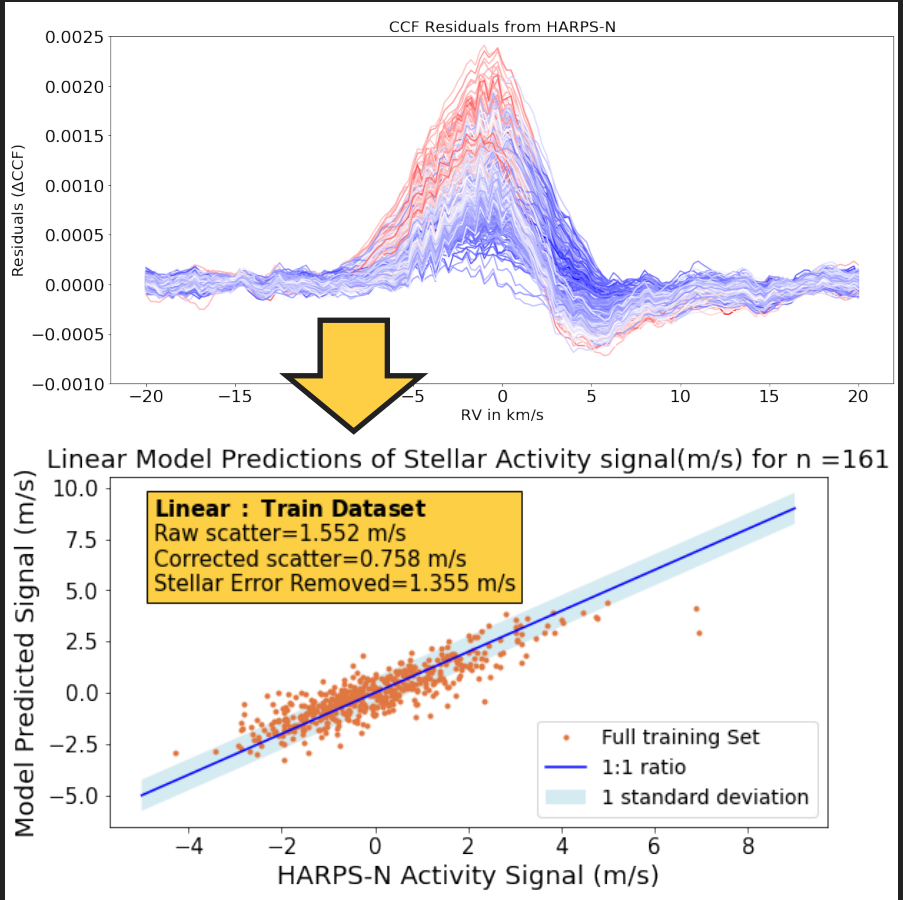
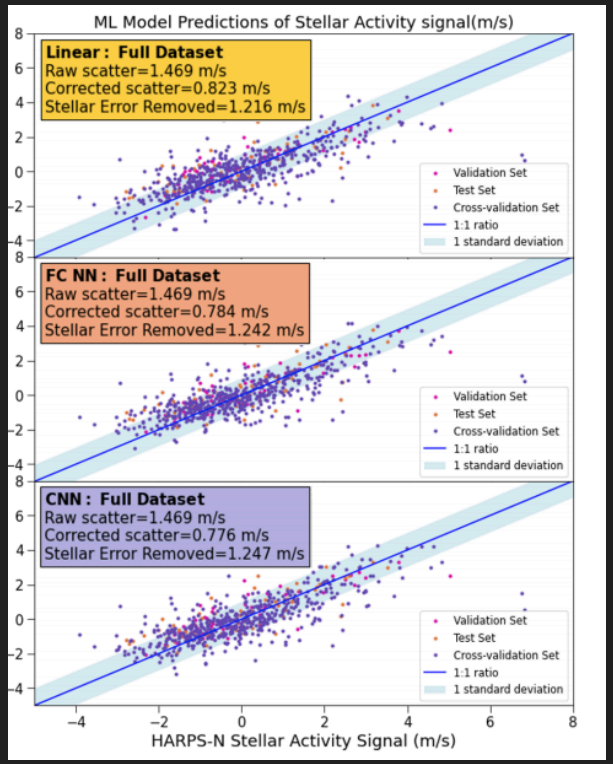


de Beurs et al. *Submitted to AJ*

For Solar Data, we reduced RV jitter by a factor of ~2 using these methods





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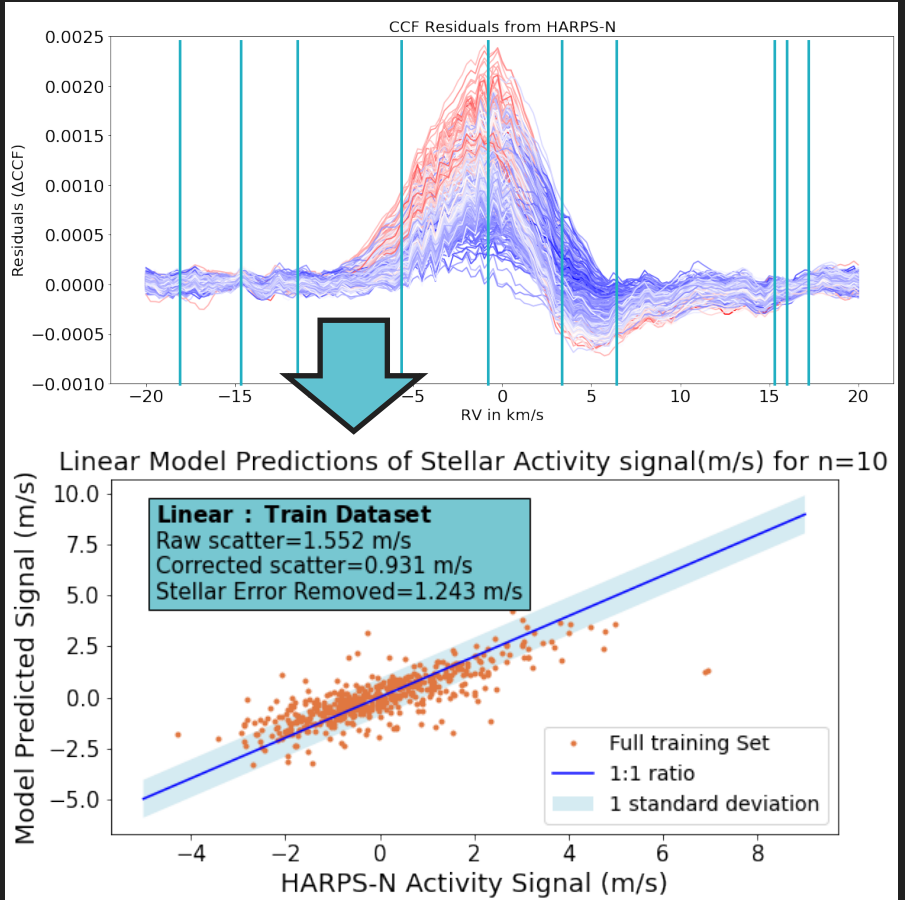
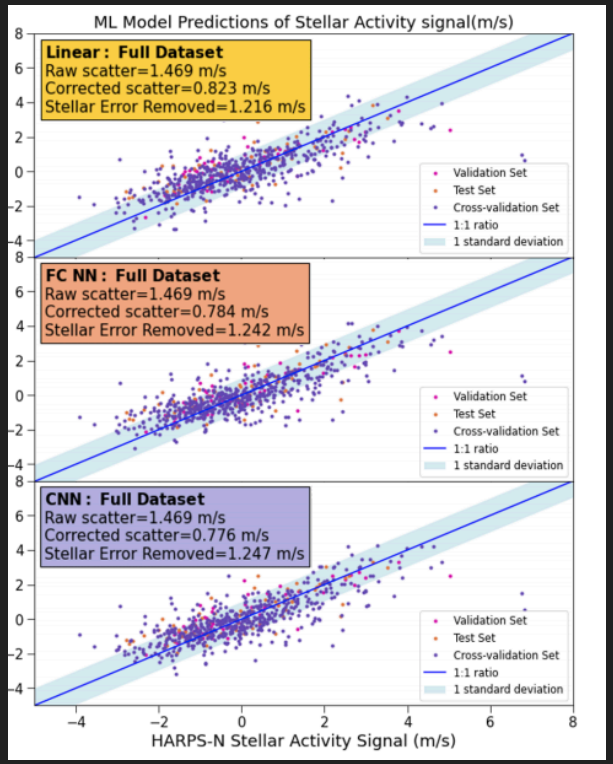
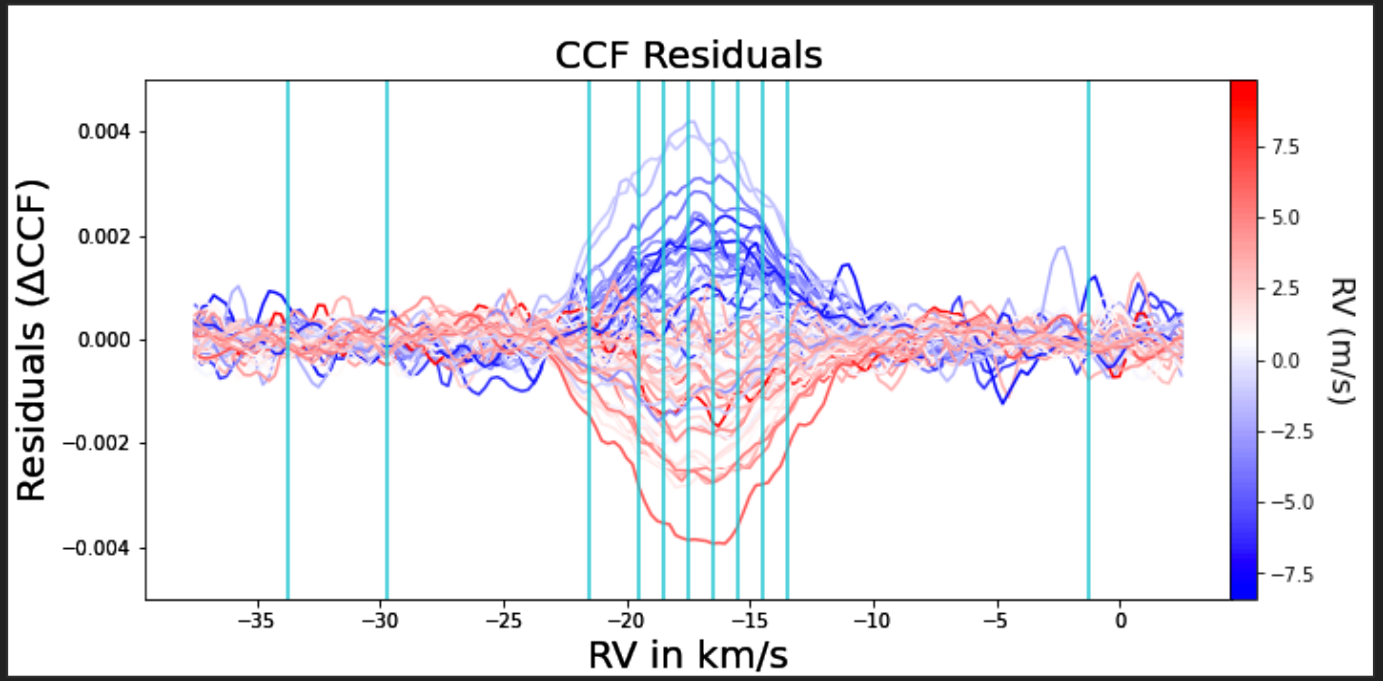


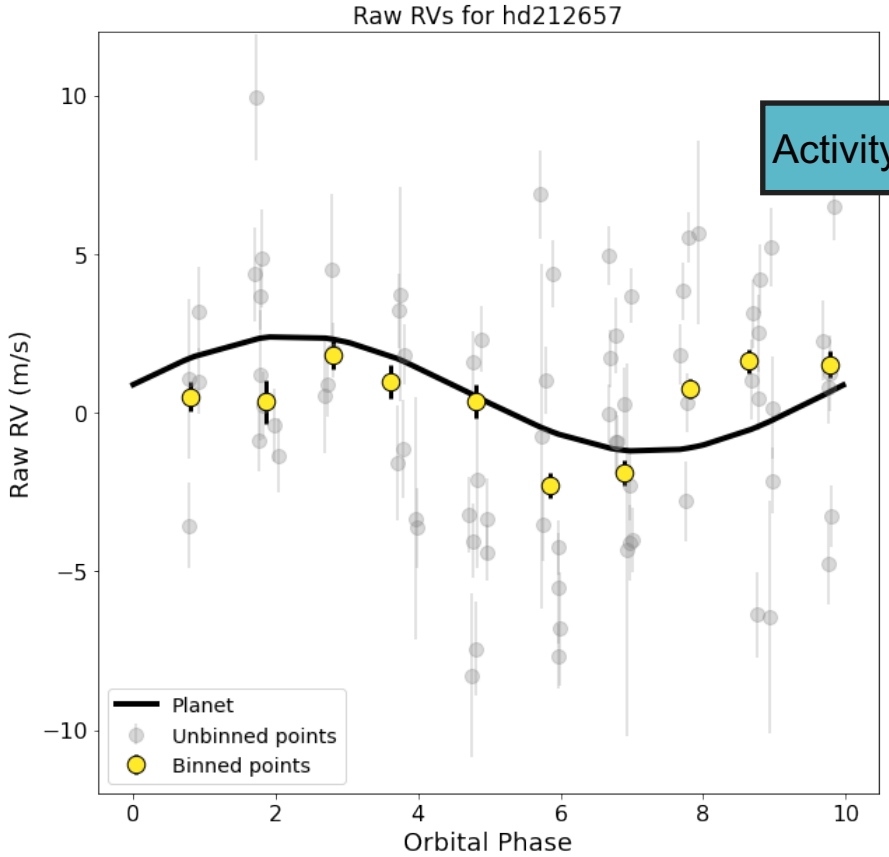


de Beurs et al. *Submitted to AJ*

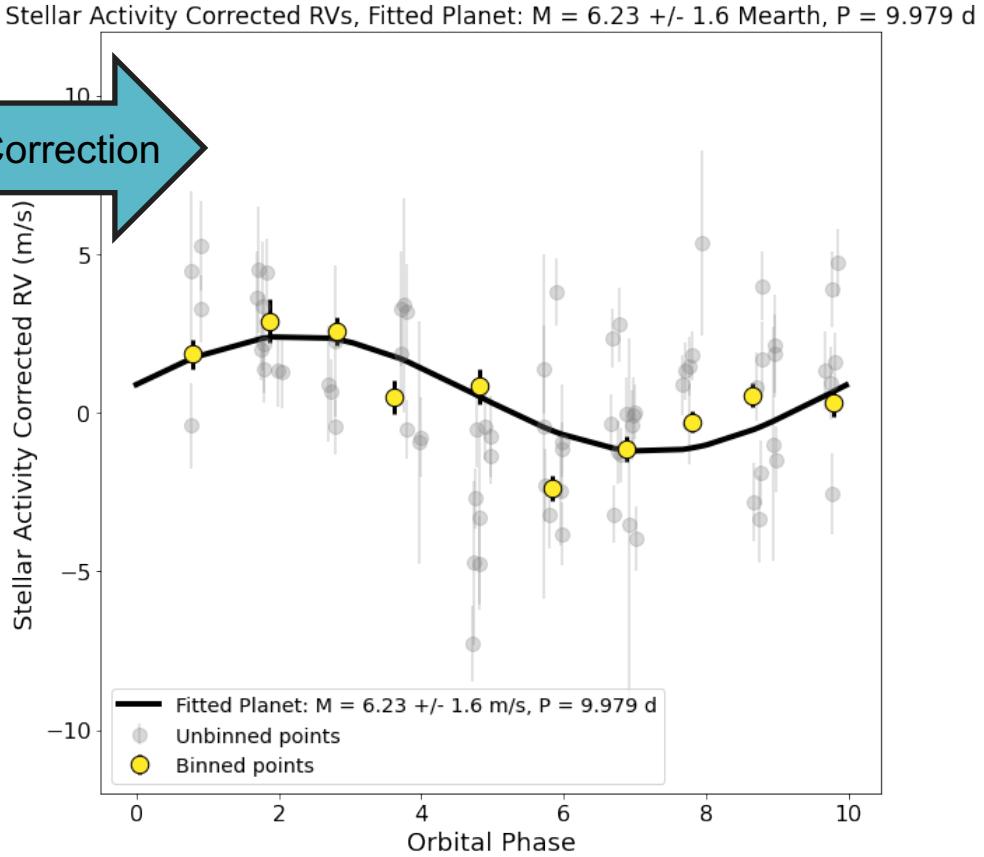
What do these CCFs look like for HD212657?



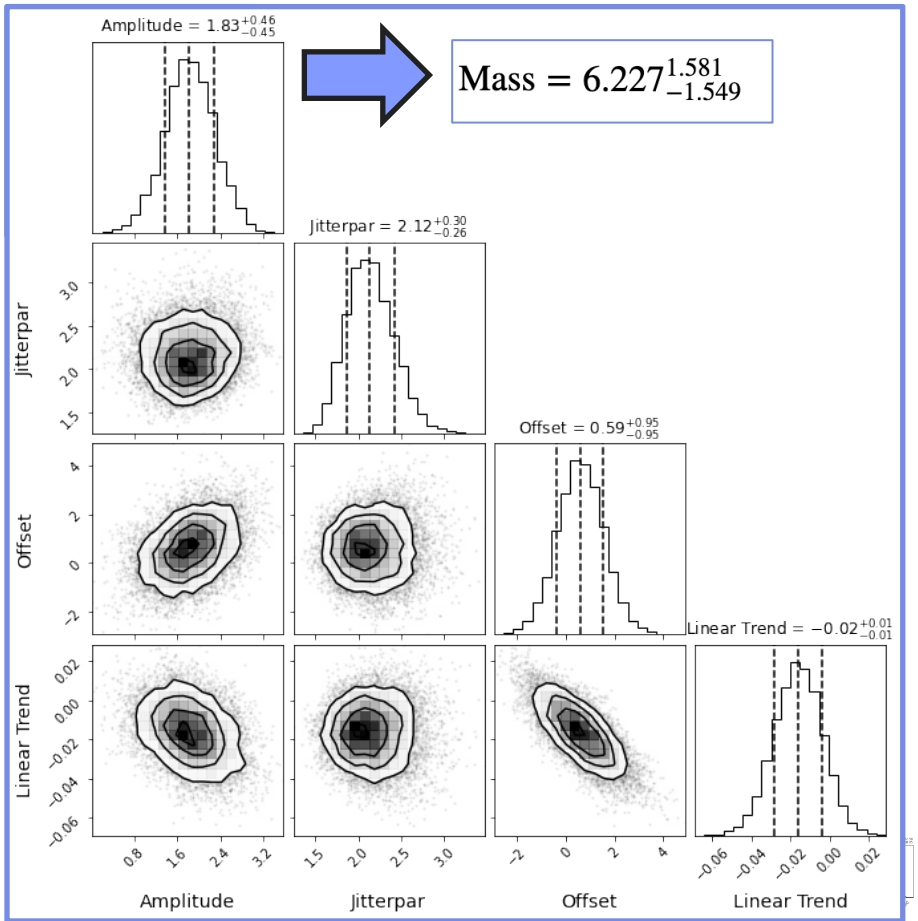
PRELIMINARY



Activity Correction



PRELIMINARY



$$\text{Mass} = 6.227^{1.581}_{-1.549}$$

Keplerian parameters

$$\text{amplitude} = 1.825^{0.463}_{-0.454}$$
$$\text{jitterpar} = 2.125^{0.297}_{-0.258}$$
$$\text{offset} = 0.593^{0.952}_{-0.953}$$

Linear, quadratic trends

$$\text{trend} = -0.016^{0.012}_{-0.012}$$
$$\text{qaudr} = 0.000^{0.000}_{-0.000}$$

CCF parameters

$$\text{a0} = 1580.328^{1526.482}_{-1506.825}$$
$$\text{a1} = -3056.947^{1346.053}_{-1378.921}$$
$$\text{a2} = 2600.021^{1870.059}_{-1872.309}$$
$$\text{a3} = -1953.458^{1819.879}_{-1881.835}$$
$$\text{a4} = -2964.553^{1673.262}_{-1646.756}$$
$$\text{a5} = 147.635^{1399.331}_{-1374.990}$$
$$\text{a6} = -59.731^{1330.657}_{-1333.865}$$
$$\text{a7} = 2809.526^{1782.936}_{-1706.665}$$
$$\text{a8} = -2108.165^{2129.579}_{-2095.533}$$
$$\text{a9} = 1605.516^{2053.081}_{-1989.552}$$
$$\text{a10} = -1759.522^{1482.583}_{-1408.055}$$