# HD110058 Overview

- SPHERE IRDIS and IFS observations: 2015-04-03 in YJH-K12, 2015-04-12 in YJ-H23
- Data reduced using PCA ADI and combined between epochs.
- Spine fit using Gaussian profiles in order to study disk morphology.
- Reflectance spectra extracted from reduced images and calibrated using fake disk injection. [In Progress]
- Proposal submitted to observe in SPHERE BBH in hopes of getting better SNR in the outer regions in order to confirm and characterise the outer warp.
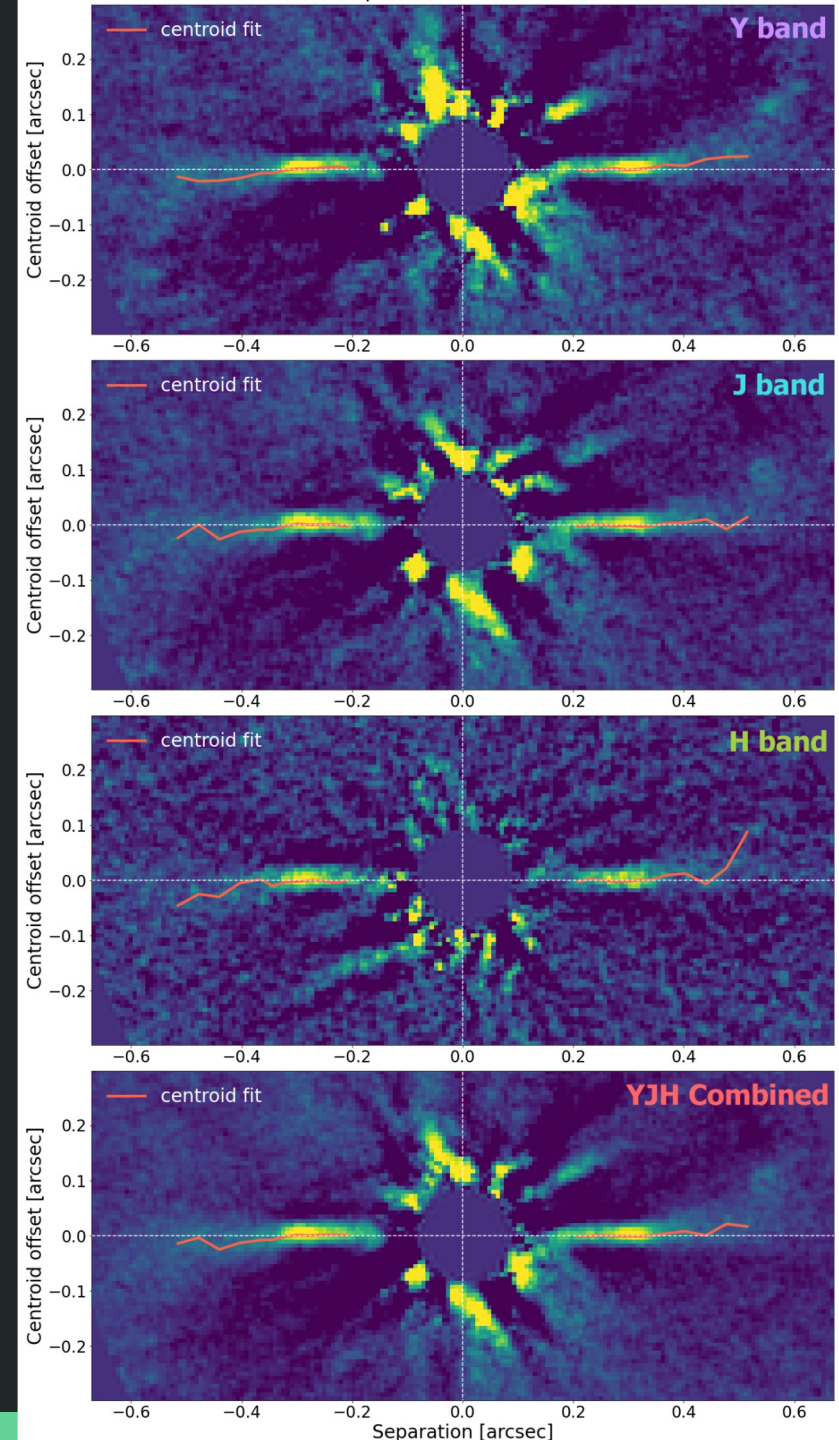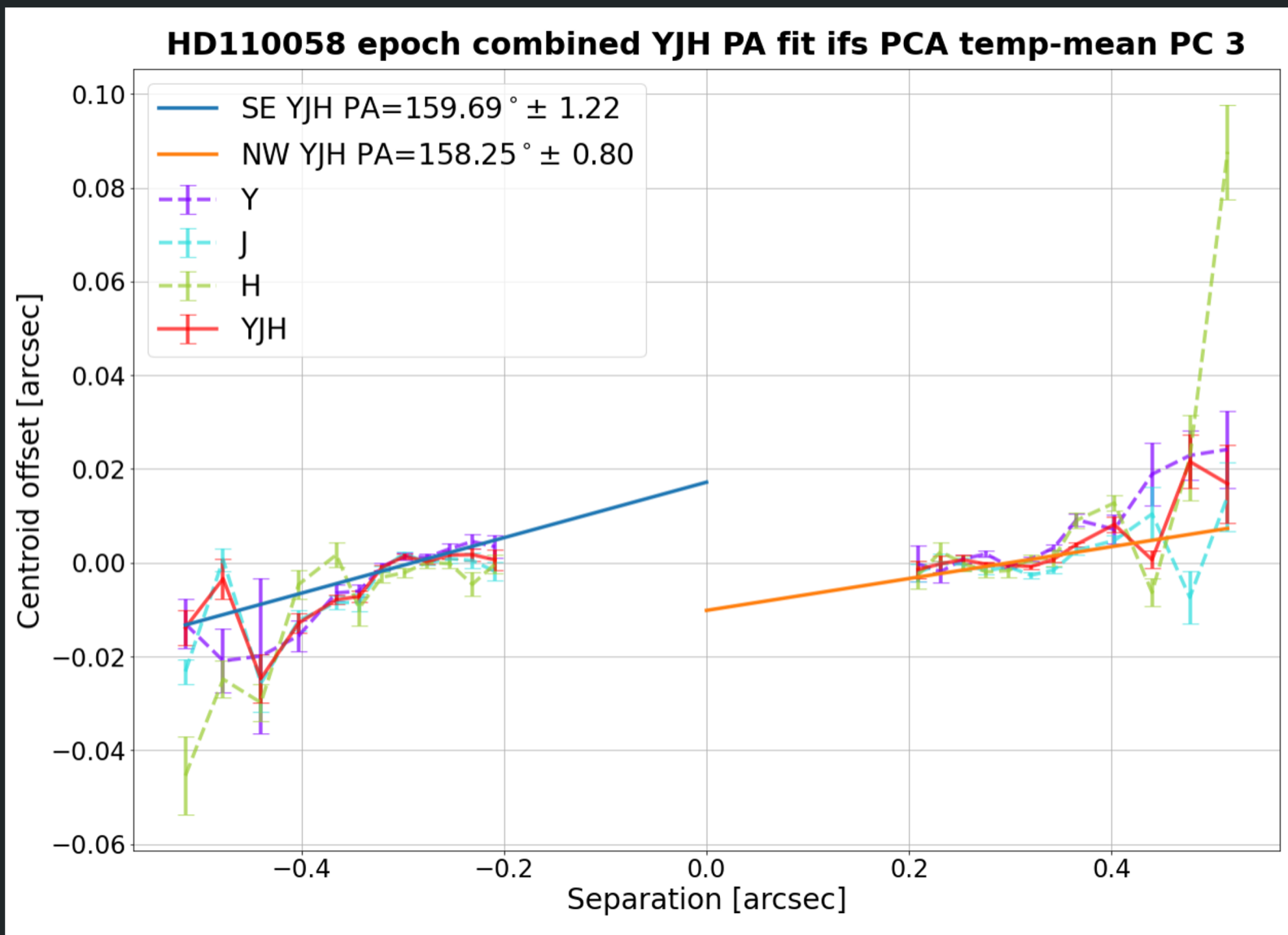- Paper in prep.
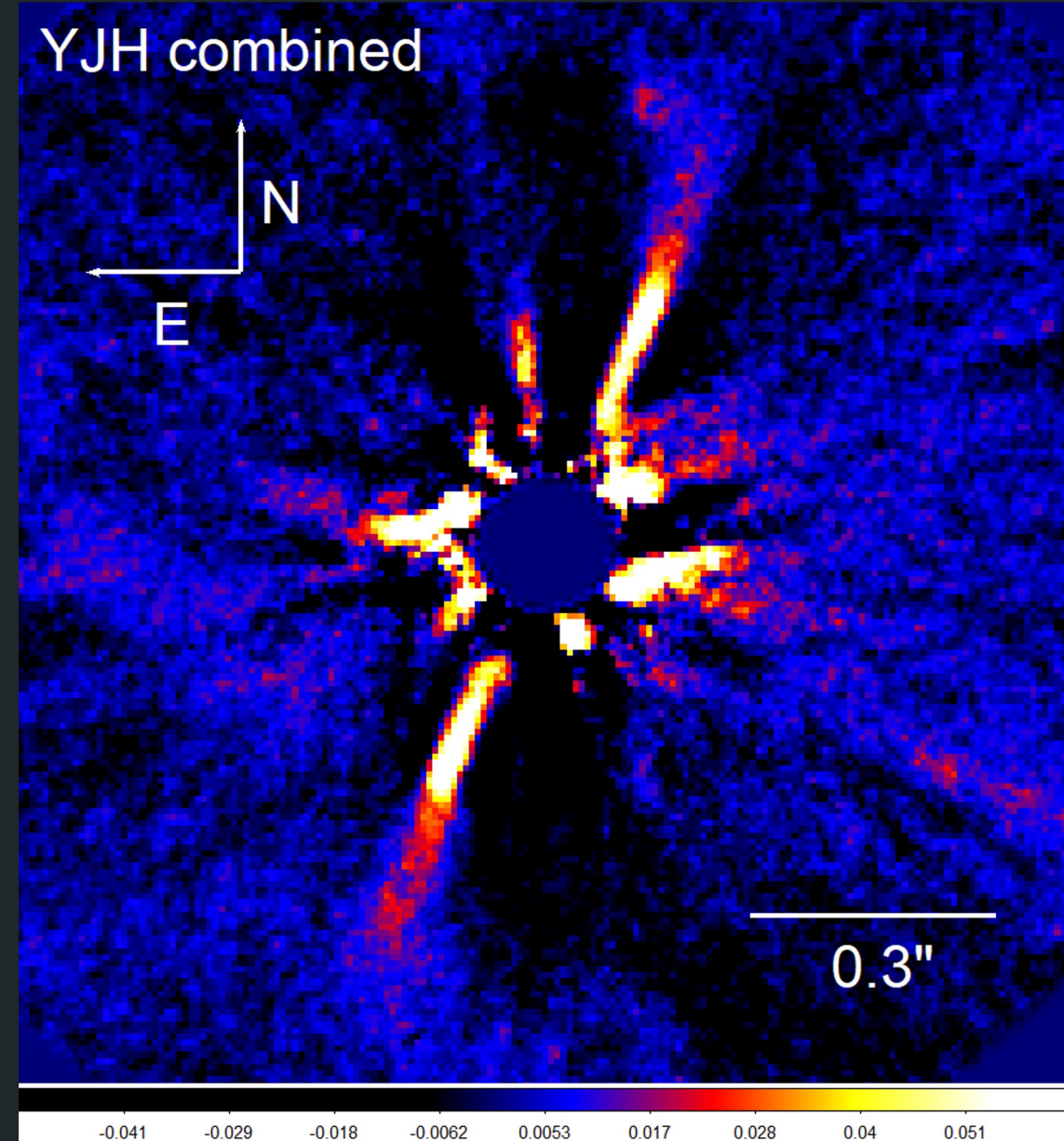
HD 110058: 2015-04-03 IFS YJH + 2015-04-12 IFS YJ, IRDIS H23 combined
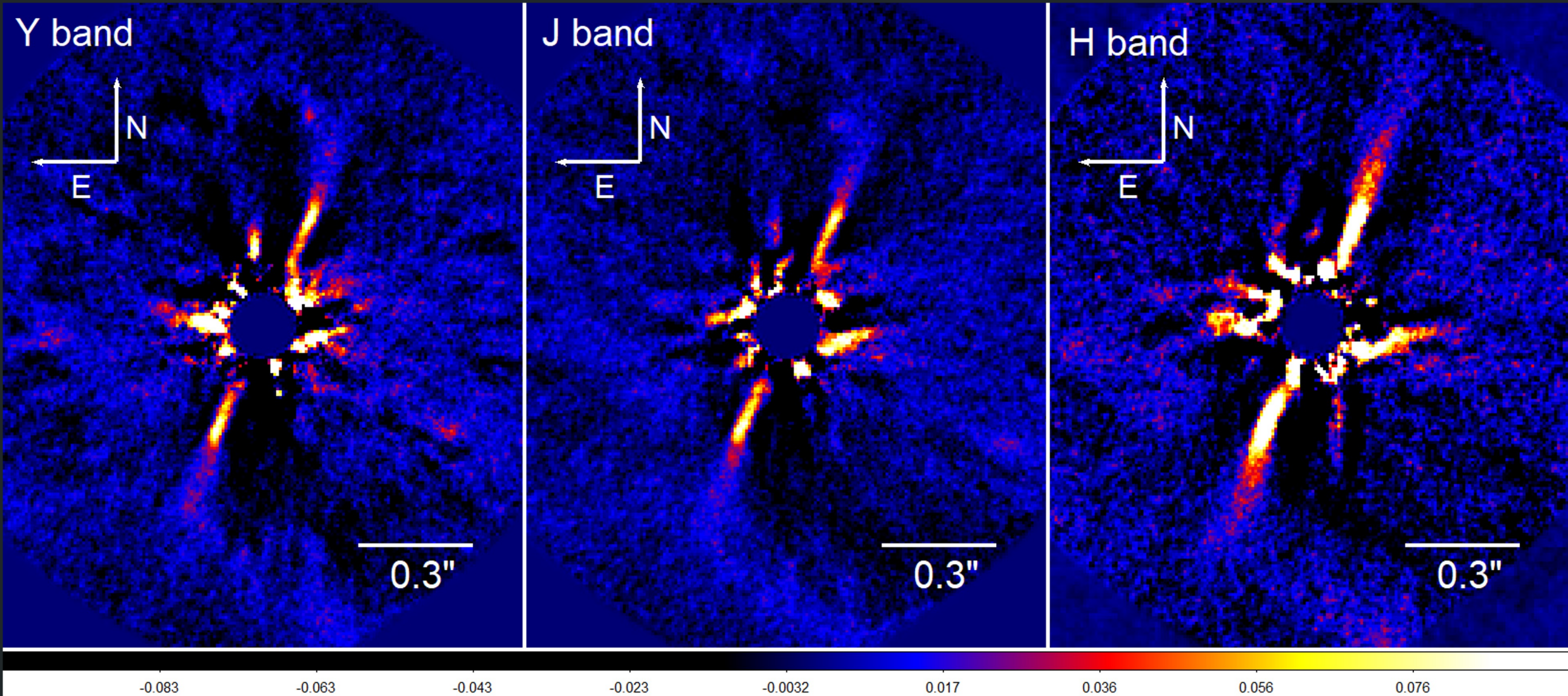
PCA ADI reduction with 3 PCs + temporal mean normalisation; channels combined using weighted disk SNR

Position angle and spine fitting

HD110058 epoch combined YJH PA fit ifs PCA temp-mean PC 3

Constraints for an inner planetary perturber

The mass-separation relation for a planet in the system causing the perturbation can be found using the equation:

$$\log\left(\frac{R_W}{10AU}\right) = 0.29\log\left(\frac{M}{M_*}\left(\frac{D}{10AU}\right)^2\frac{t}{t_{unit}}\right) - 0.2$$

Where M_*, M, R_W, D, t, and tunit are the mass of the star, mass of the planet, radius of warp in the parent body disk, planetary orbital radius, age of system, and time unit $\sqrt{(10AU) 3/(GM_*)} \sim 5.2$ y. (Augereau+ 2001).

The minimum warp radius from the reduced images is 60AU, however due to the low SNR of the disk beyond 65AU means we are unable to constrain this to more than a minimum value.
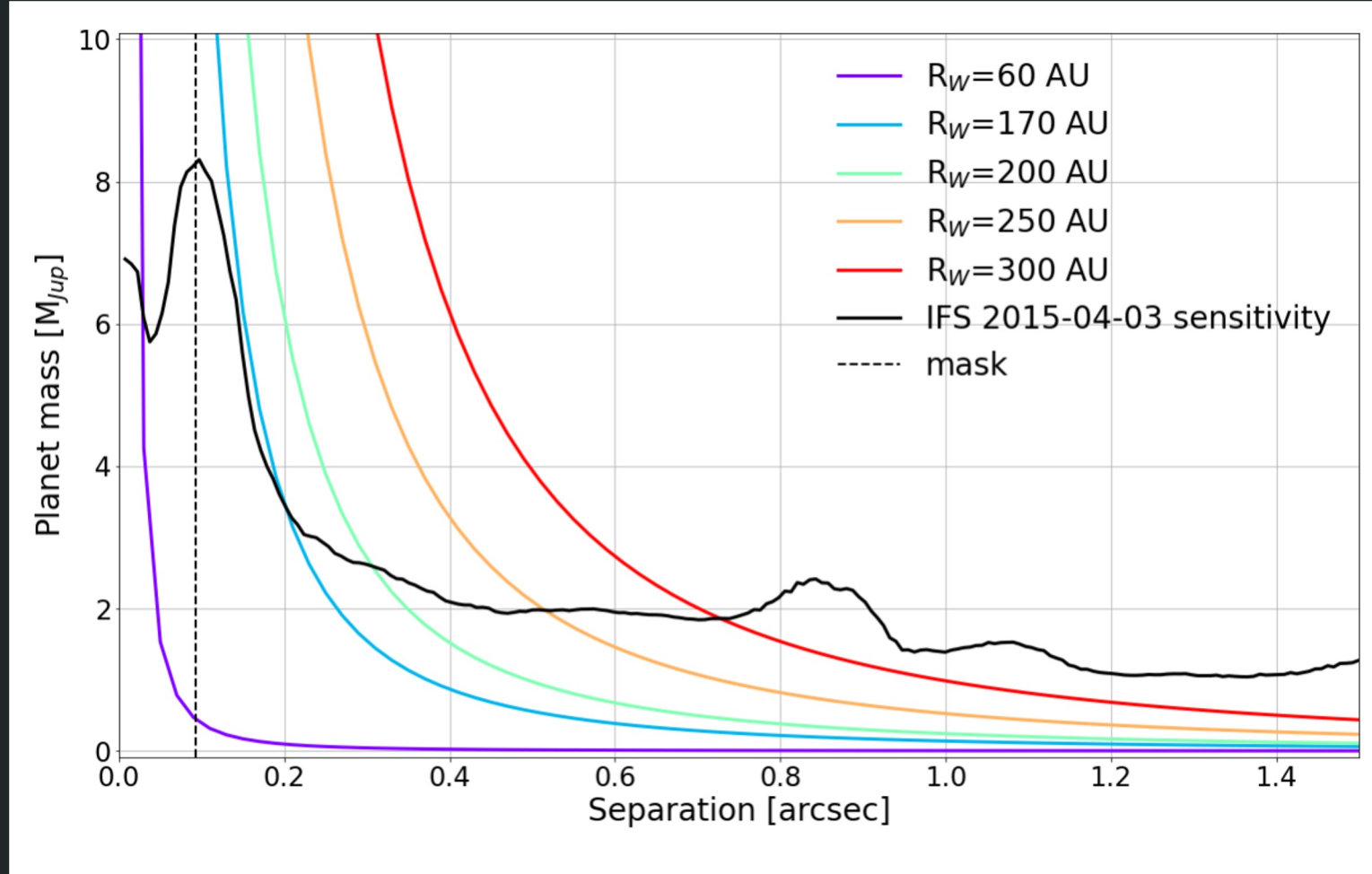
Mass sensitivity of PCA ASDI reduced 2015-04-03 data with planetary perturber mass-separation relation for different warp radii