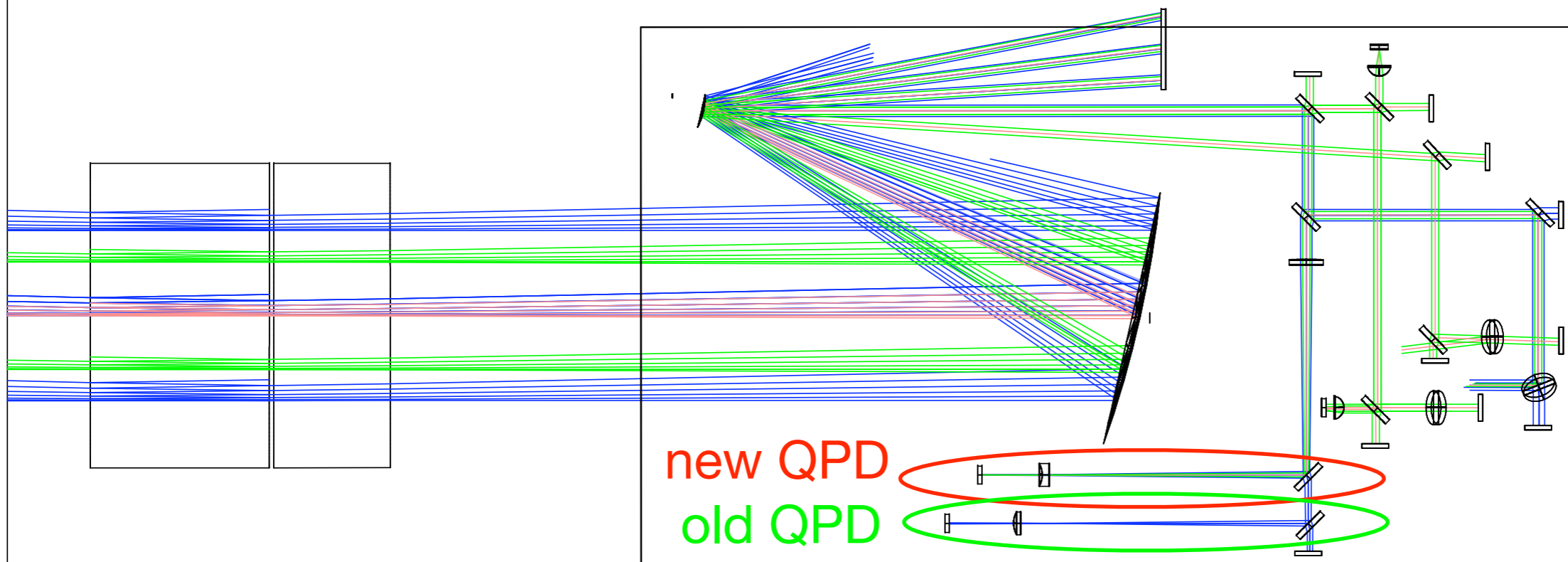


LIGO

Blue: IR beams w/ 9cm radius

Green: 532nm beams w/ 6cm radius

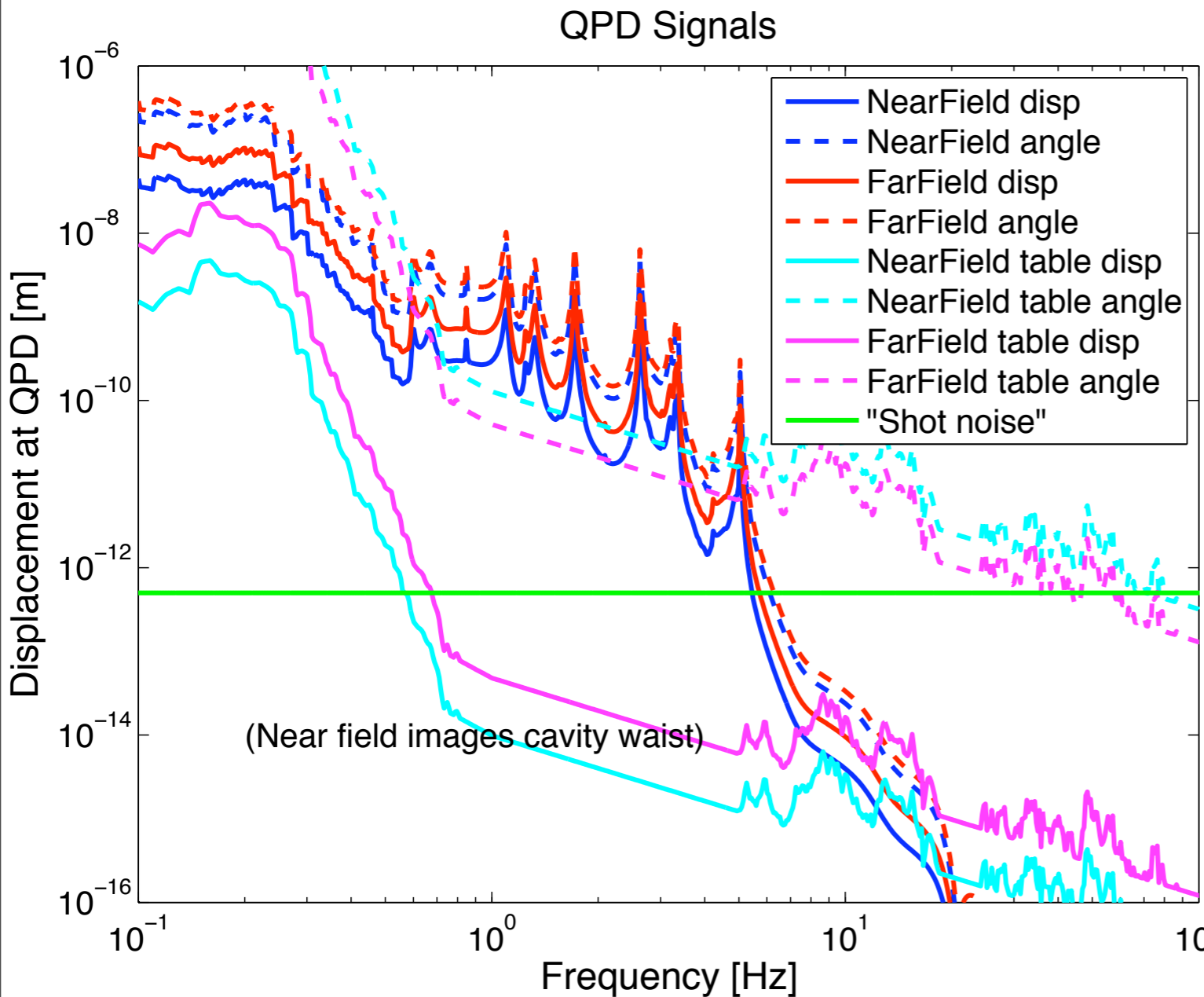


3D LAYOUT

THU APR 2 2009

ETM-TEL_TRANSMON.ZMX
CONFIGURATION 1 OF 1

- Changes:
 - $f_0 = 572.7\text{mm}$ from 687.5 mm
 - $f_1 = 57.4\text{ mm}$ from 68.8 mm
 - $f_2 = -57.4\text{ mm}$ (new)
- Gouy phases:
 - ETM = 11.3 deg
 - QPD 1 = 12.5 deg
 - QPD 2 = 89 deg
- Waist sizes:
 - ETM = 61 mm
 - QPD 1 = .48 mm
 - QPD 2 = .41 mm



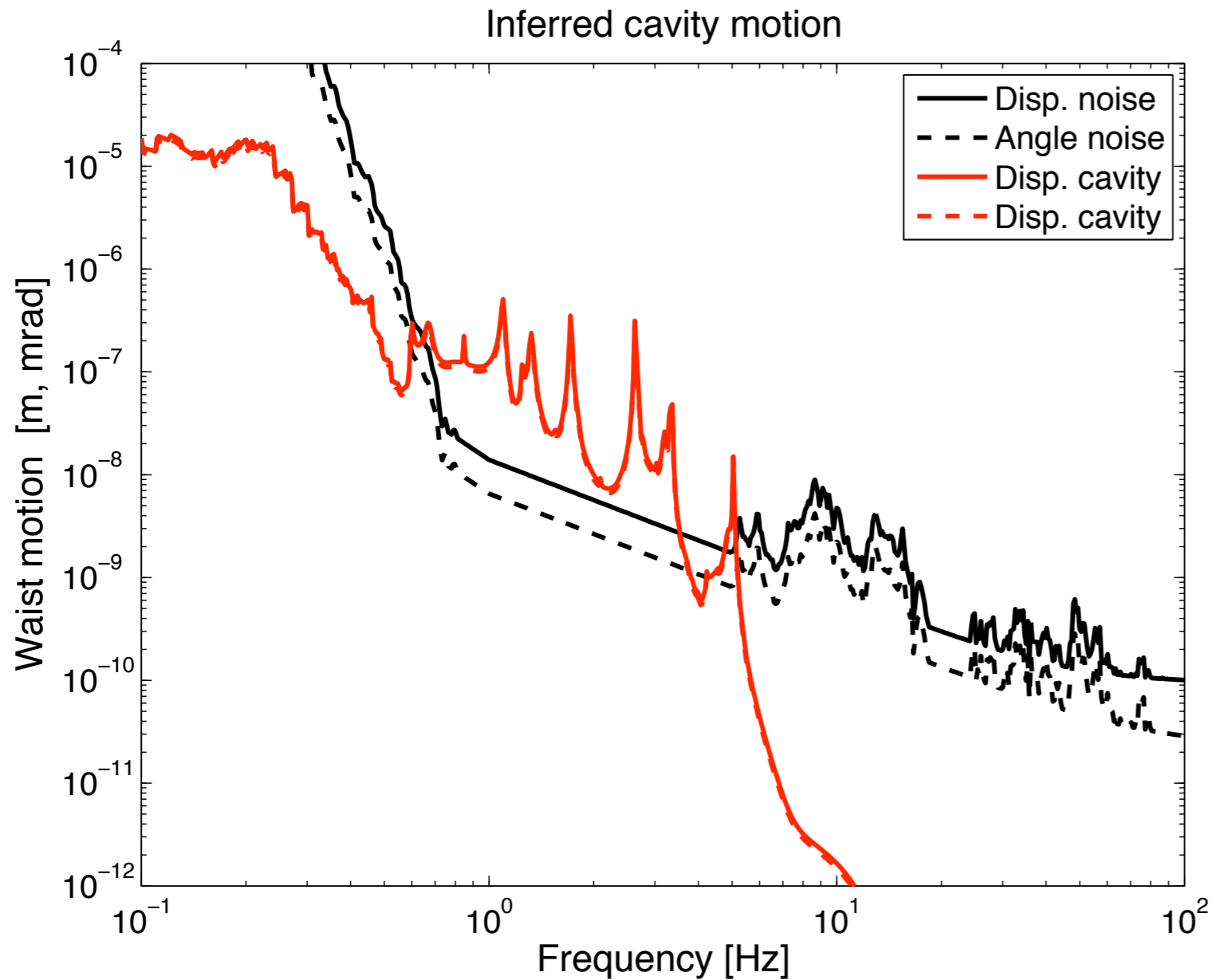
- Take LisaBar's TM motions and turn them into arm cavity disp. & angle

- Estimate from LisaBar, too

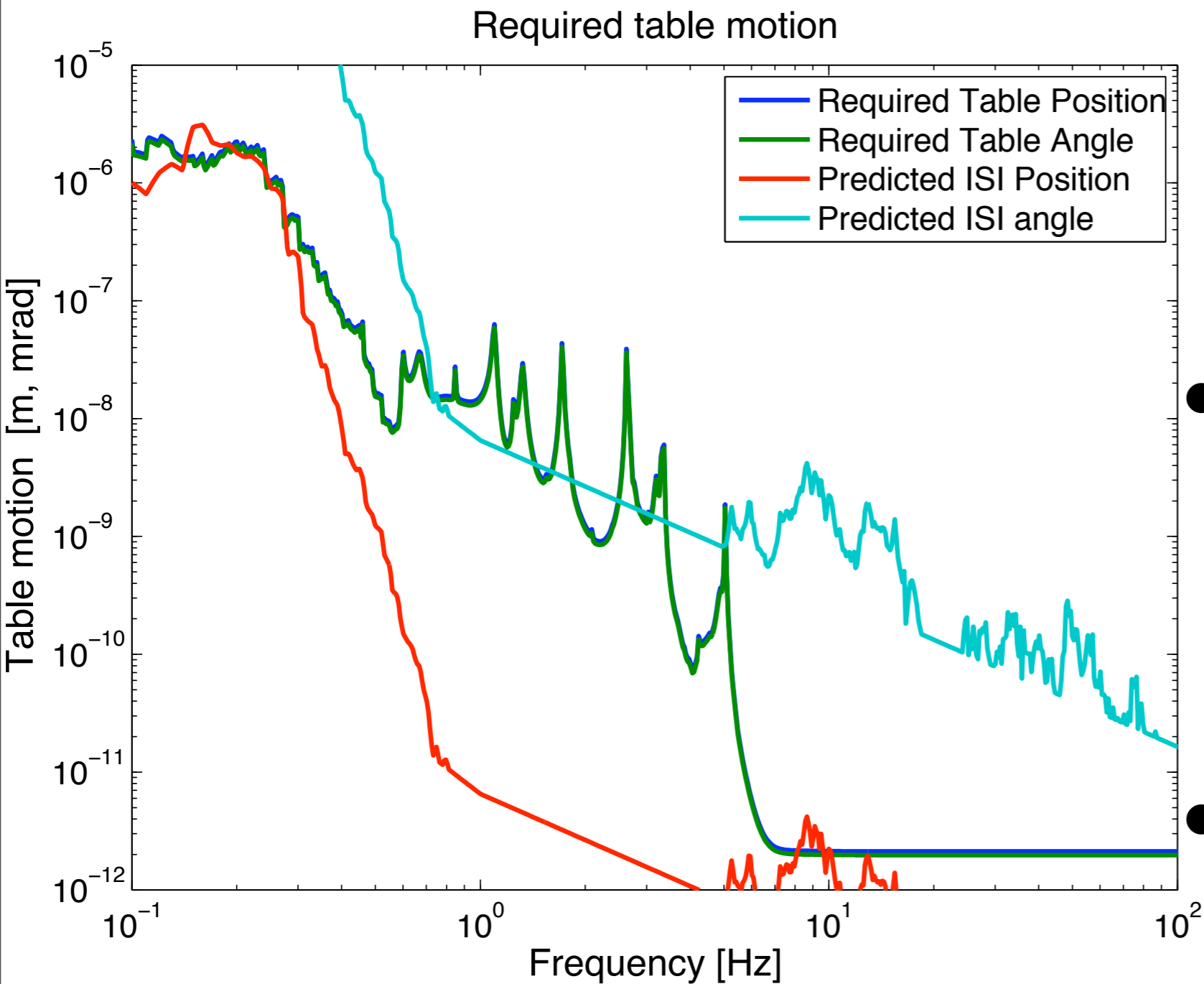
- Shot noise based on 100 mA

- Propagate to QPDs

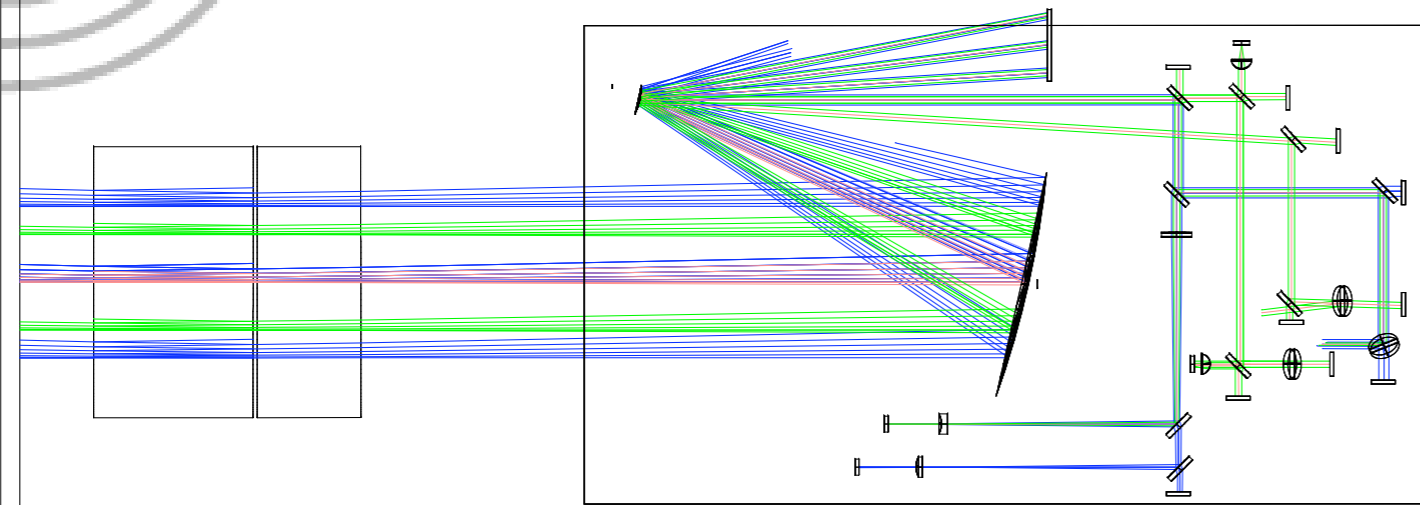




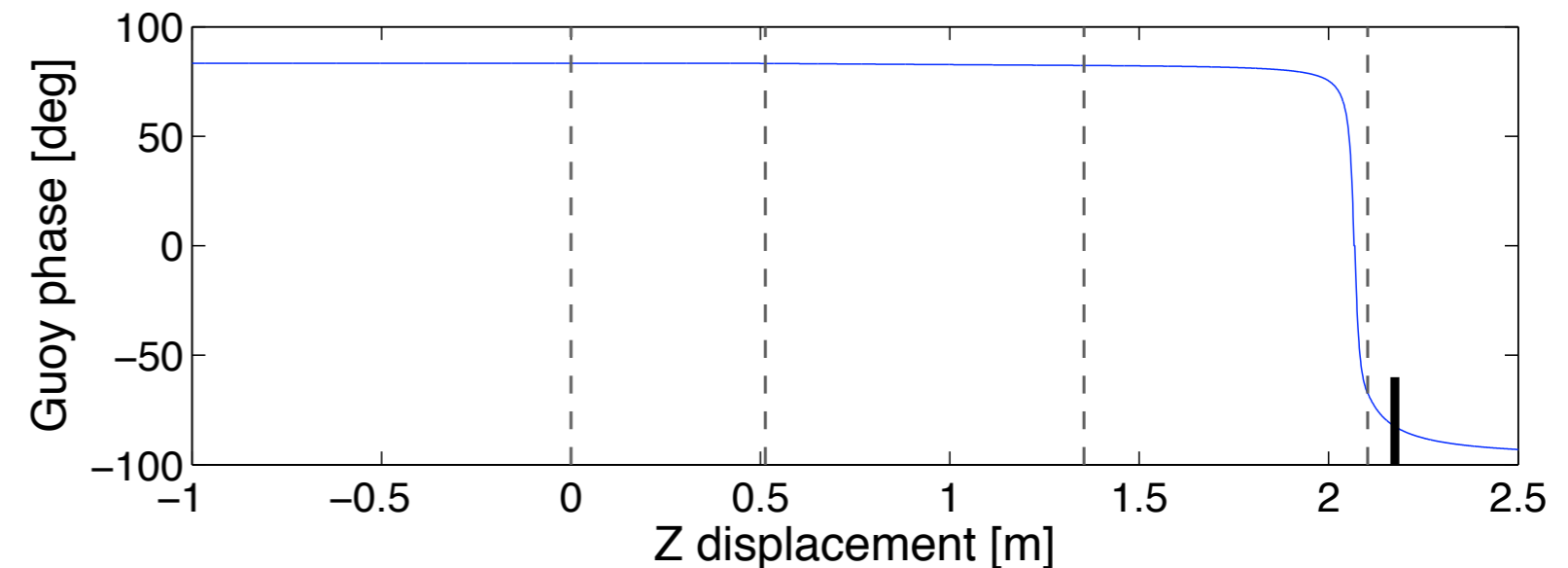
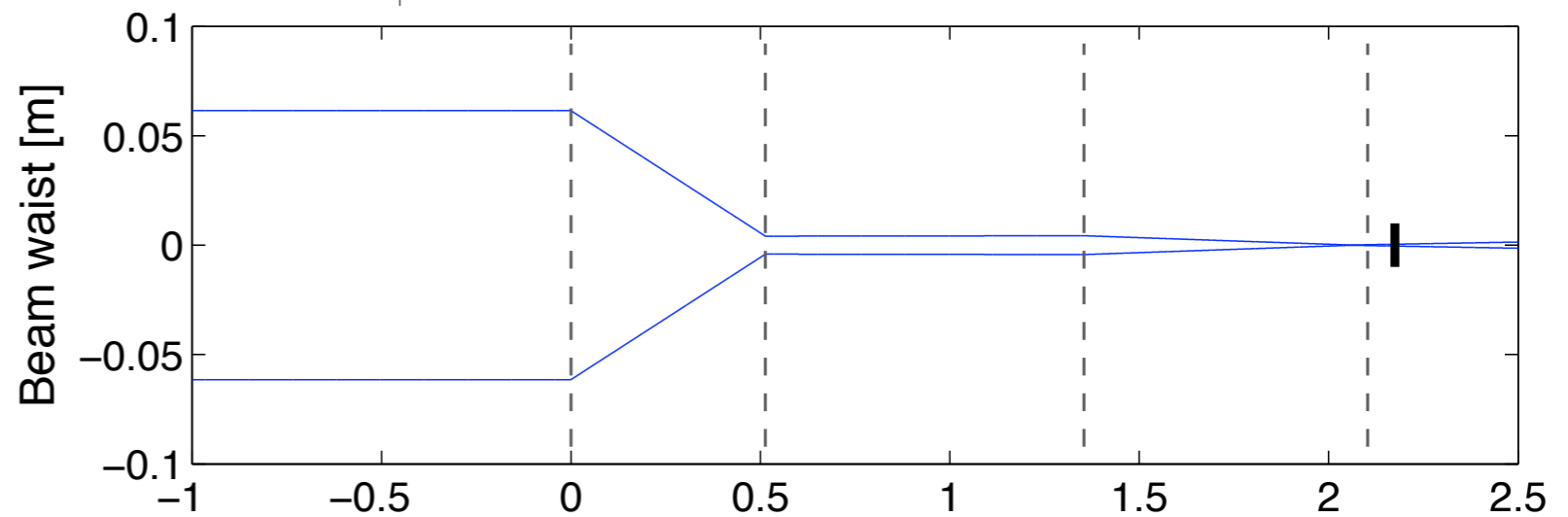
- Propagate “noises” from QPDs back to cavity basis



- Required table motion is 1/5 the cavity motion and 1/10th shot noise
- We should consider isolation in the band 1-10 Hz to beat required curves
- Note displacement is OK.



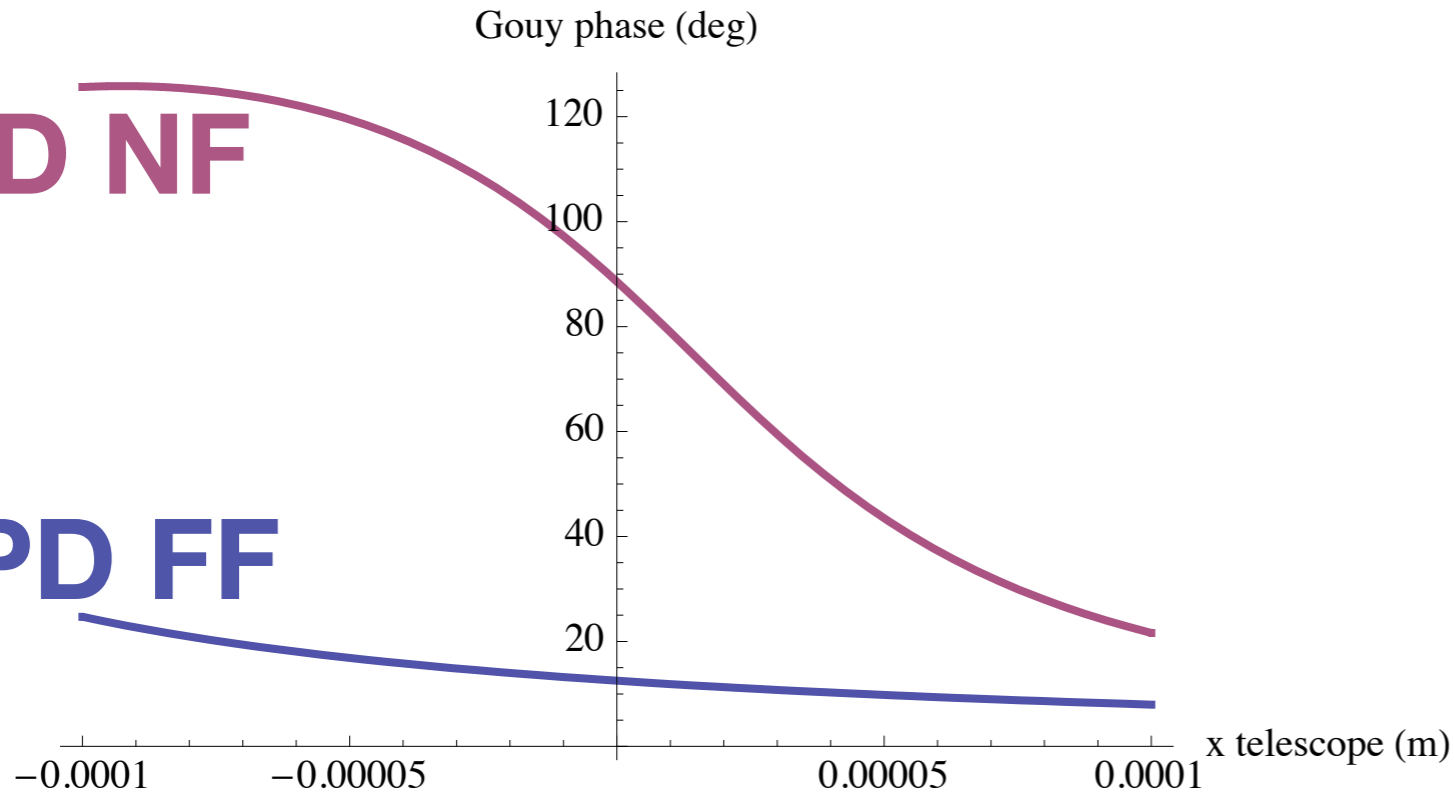
- Beam line to “far field” QPD
- Very fast telescope: $f/4$



● Sensitivity to Beam reducing telescope

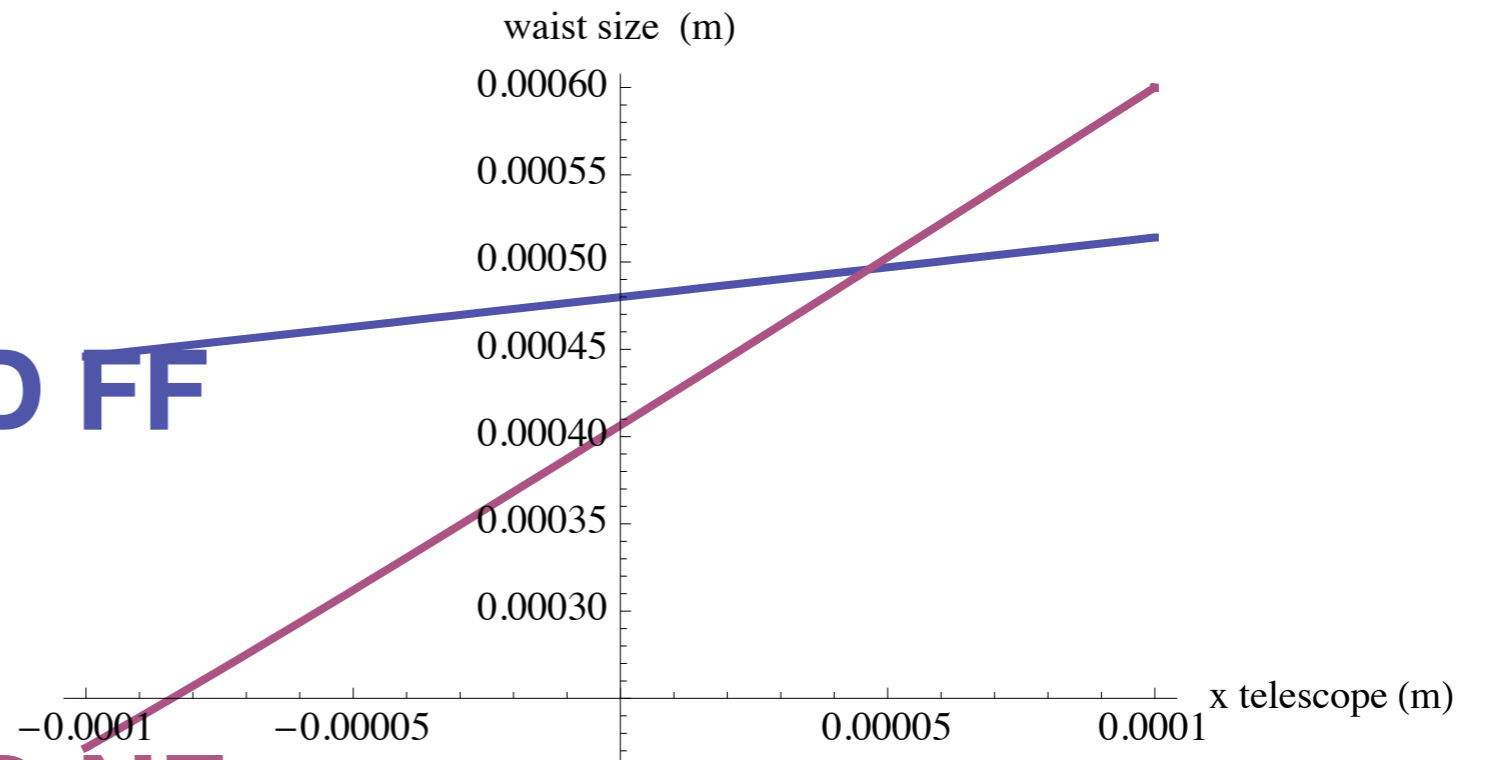
QPD NF

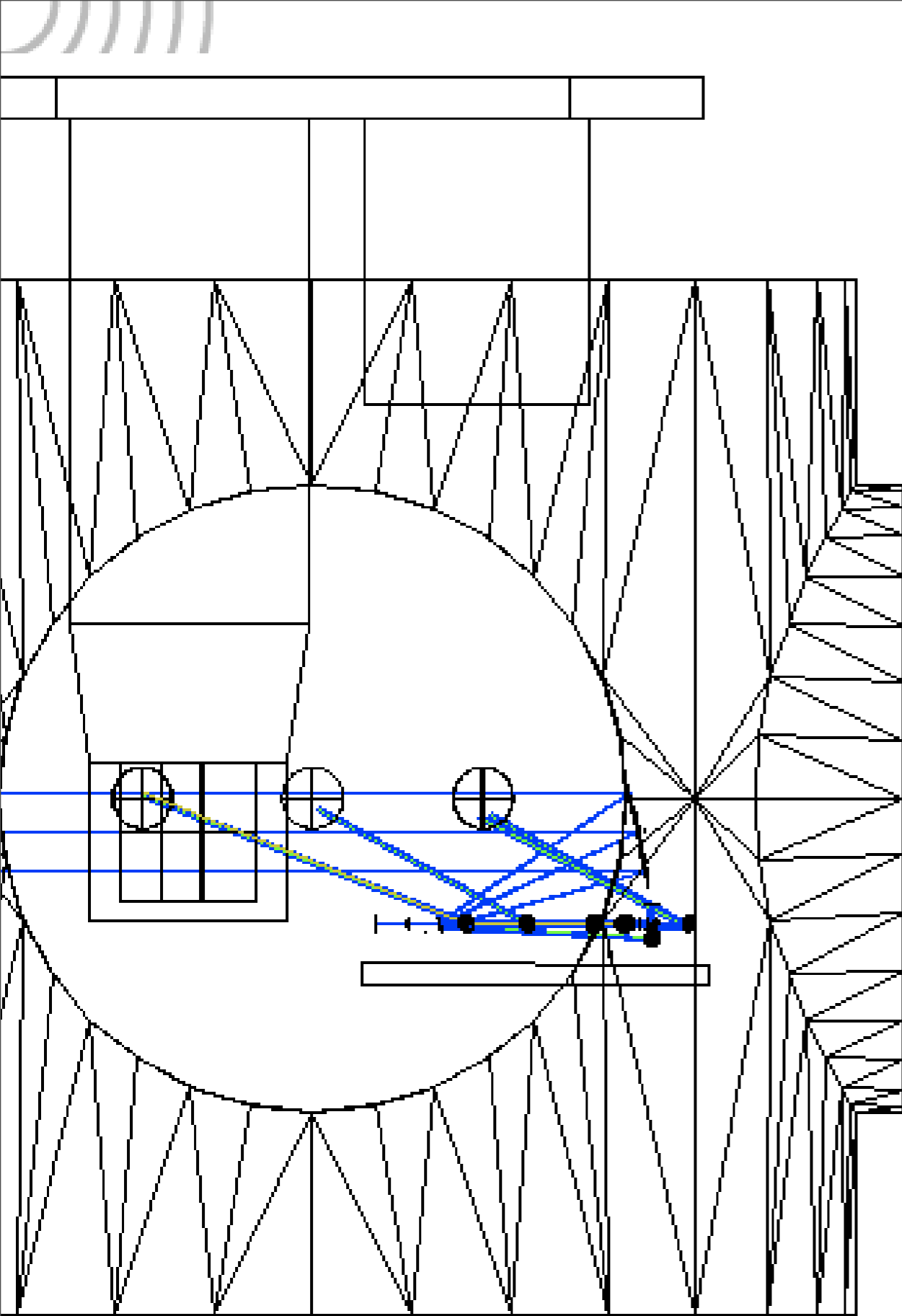
QPD FF



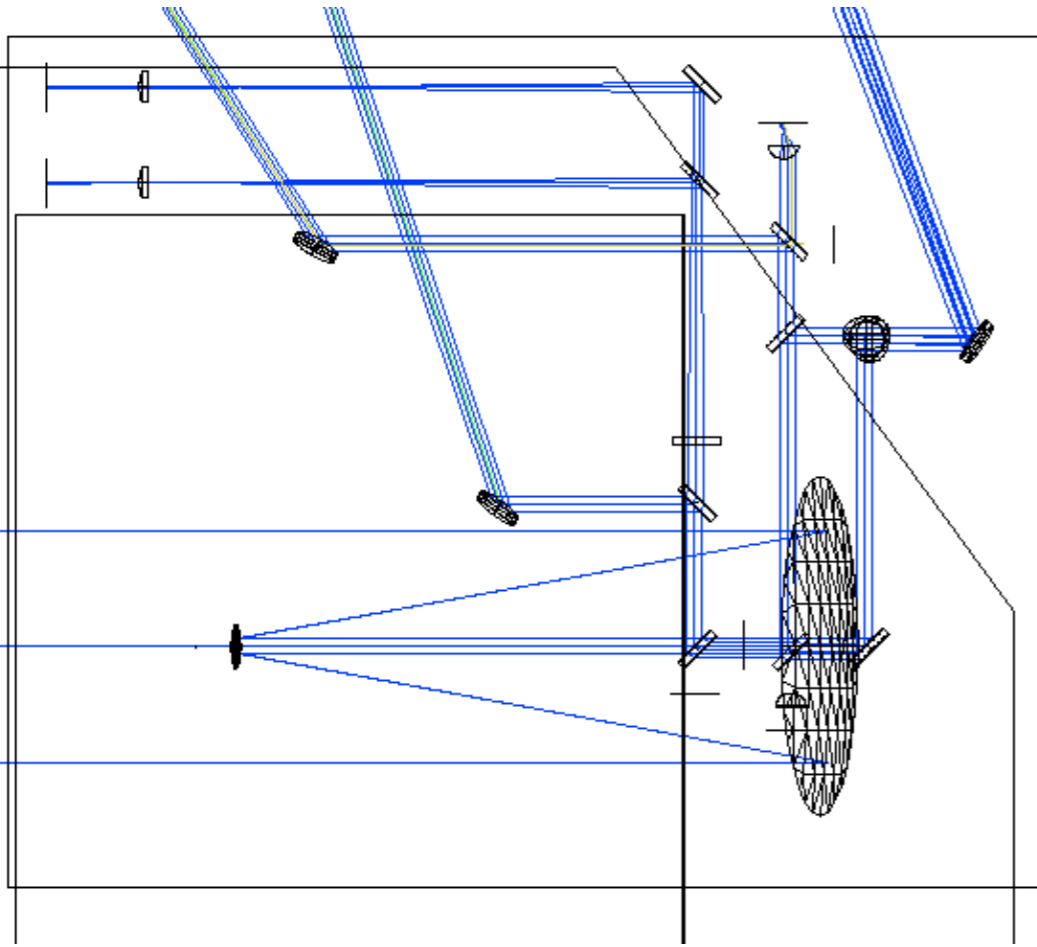
QPD FF

QPD NF





- Reorientation excellent
- Hartmann reference out of plane (relative polarization?)
- Tough angles for windows
- Interference with quad?



- Fix QPD lengths
- No beam “recombination” on Hartmann path
- Green QPDs should move to input side of beamsplitters
- Set green QPD gouy phases
- Add IR beam dump and shutter