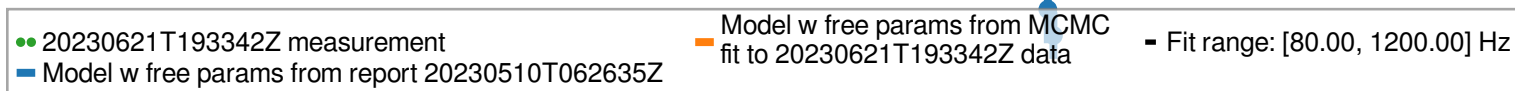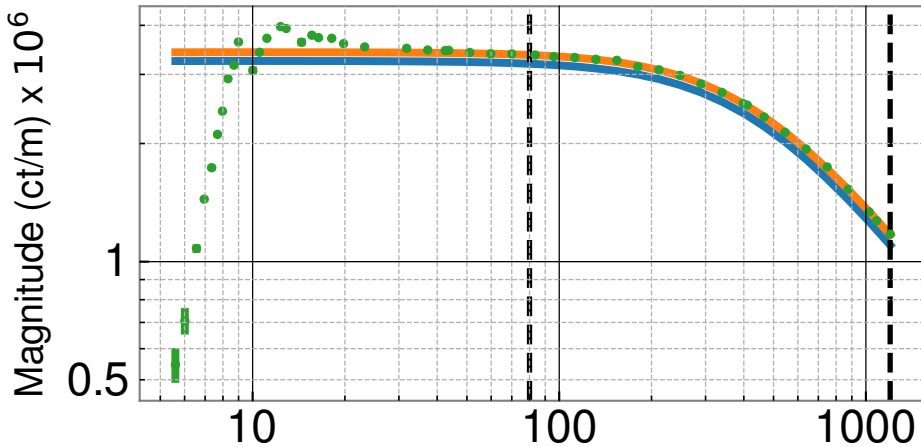# H1 sensing model MCMC summary
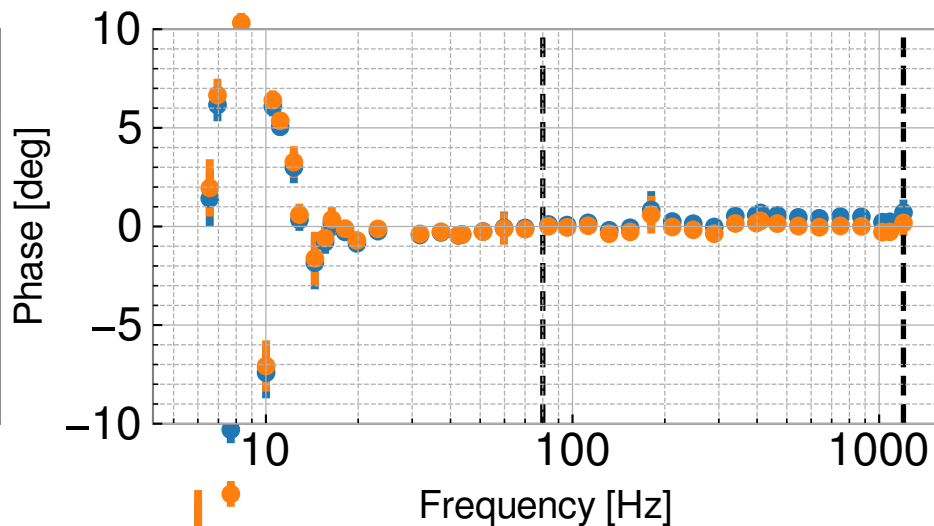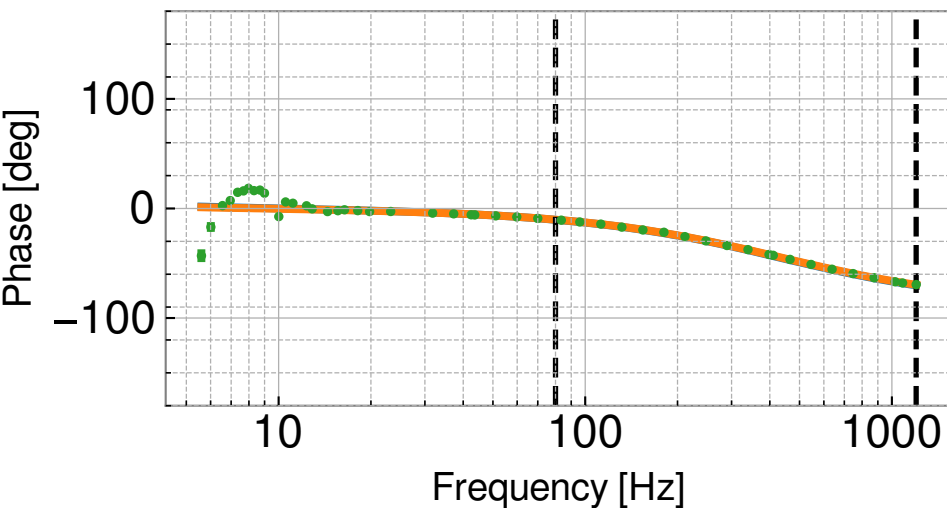
All fixed parameters drawn from /ligo/groups/cal/H1/reports/20230621T191615Z/pydarm_H1.ini

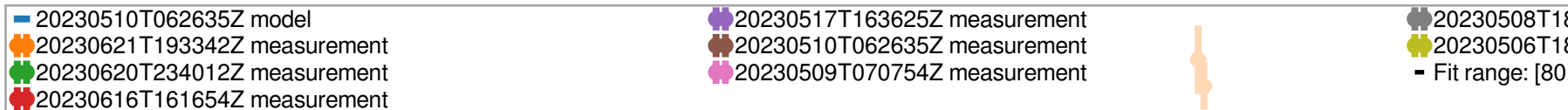| Parameter	(value +/-)	value	+	-
Optical gain, H_c (ct/m)		3.418e+06	3016 (0.09%)	3345 (0.10%)
Cavity_pole, f_cc (Hz)		437.5	0.9057 (0.21%)	0.868 (0.20%)
Detuned SRC spring frequency, f_s (Hz)		0.01365	1.837 (13456.62%)	1.335 (9773.76%)
Detuned SRC spring quality factor, Q_s		-0.07729	15.76 (-20393.58%)	17.08 (-22103.17%)
Residual time delay, tau_c (s)		-7.861e-07	3.391e-07 (-43.13%)	3.35e-07 (-42.62%)

Legend:
- 20230621T193342Z measurement
- Model w free params from report 20230510T062635Z
- Model w free params from MCMC fit to 20230621T193342Z data
- Fit range: [80.00, 1200.00] Hz

20230621T193342Z sensing function
MCMC corner plot

$H_C = 3.418e + 06^{+3.016e + 03}_{-3.345e + 03}$

$f_{cc} = 4.375e + 02^{+9.057e - 01}_{-8.680e - 01}$

$f_s = 1.365e - 02^{+1.837e + 00}_{-1.335e + 00}$

$Q = -7.729e - 02^{+1.576e + 01}_{-1.708e + 01}$

$\Delta\tau_C = -7.861e - 07^{+3.39}_{-3.35}$

2d pdf contours
1σ
2σ
3σ
map
(100 bins for 1d pdf)
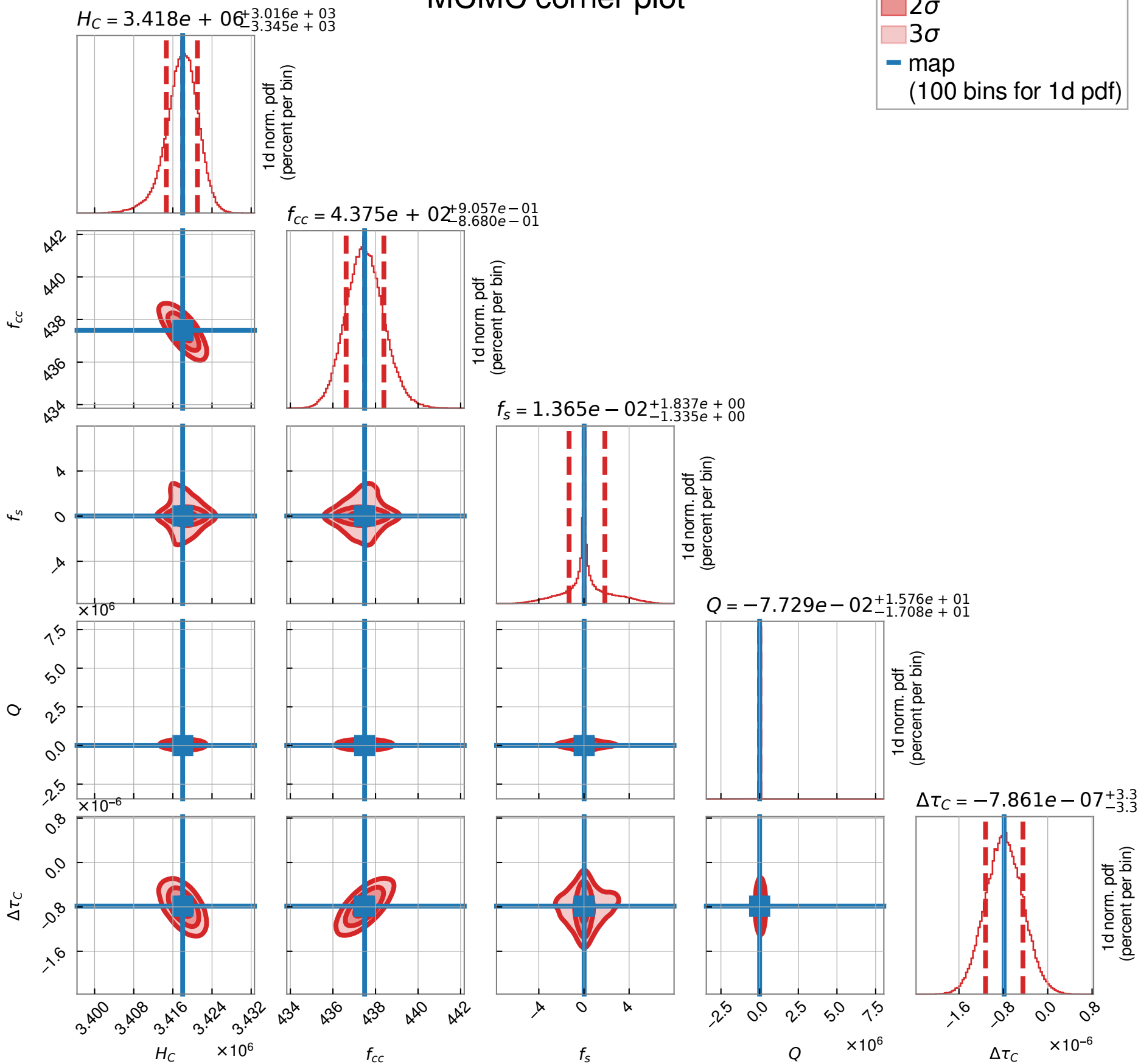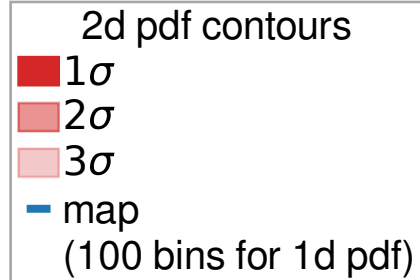
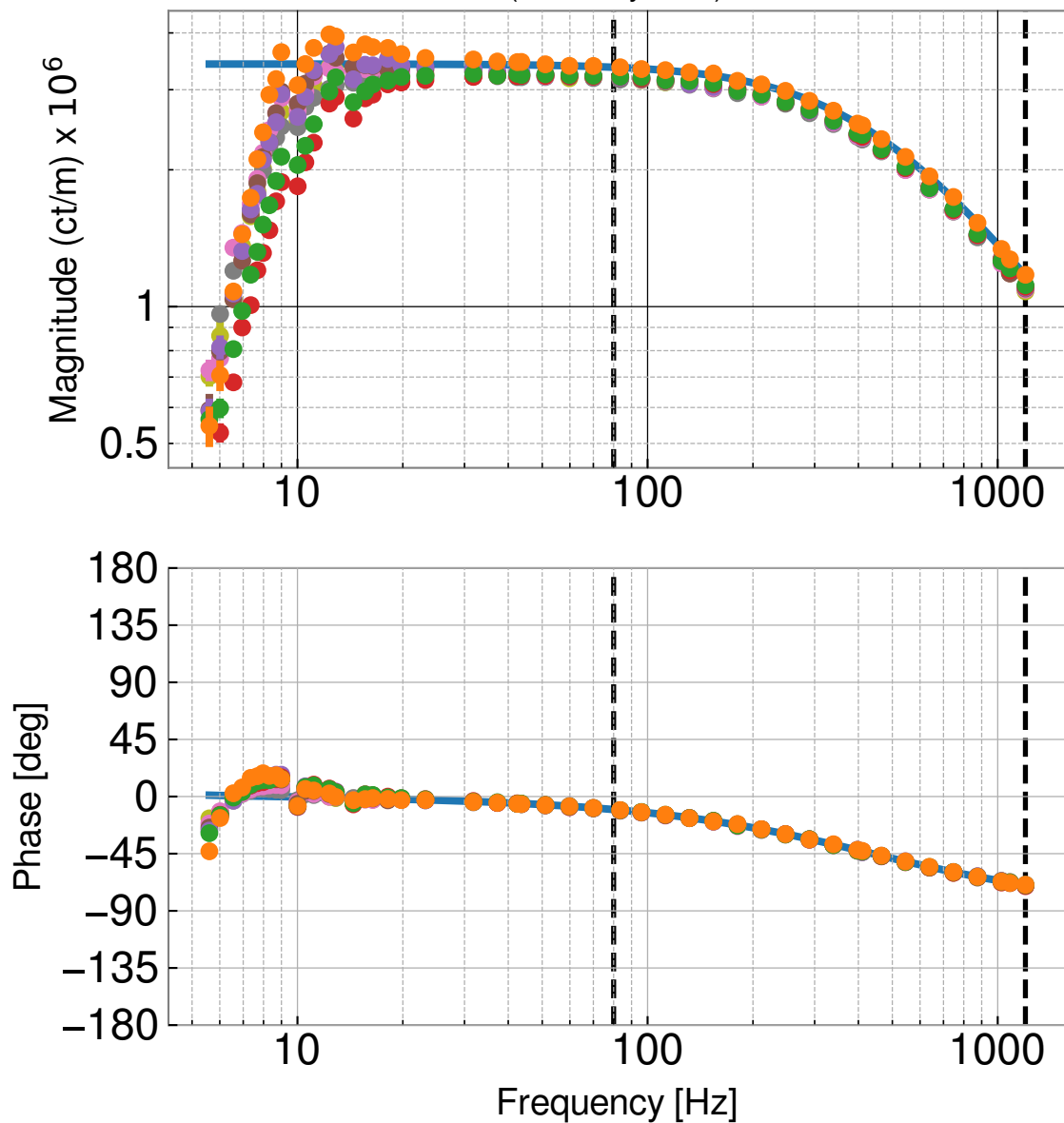# H1 sensing model history

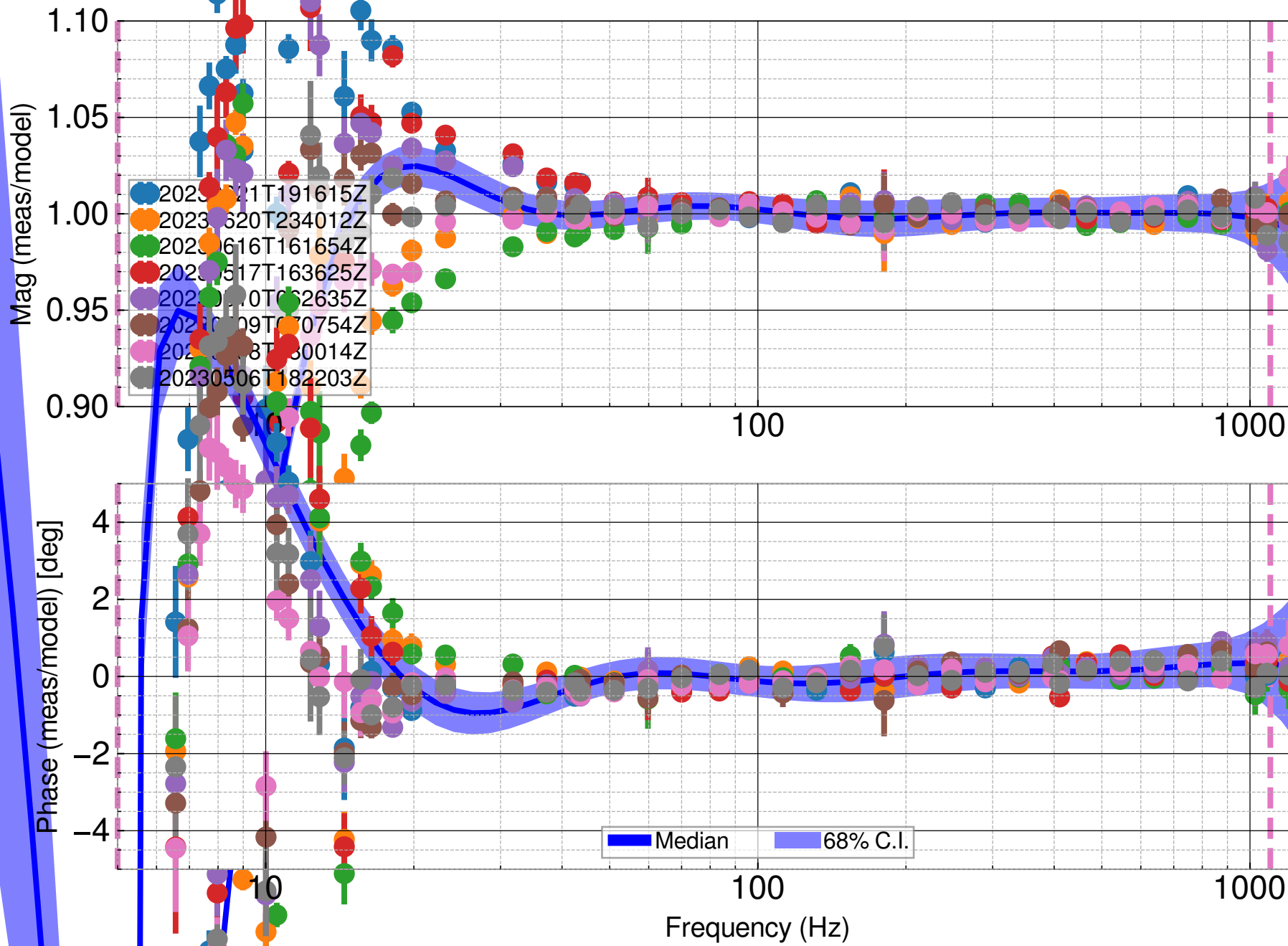All fixed parameters drawn from /ligo/groups/cal/H1/reports/20230621T191615Z/pydarm_H1.ini

Legend:
- 20230510T062635Z model
- 20230621T193342Z measurement
- 20230620T234012Z measurement
- 20230616T161654Z measurement
- 20230517T163625Z measurement
- 20230510T062635Z measurement
- 20230509T070754Z measurement
- 20230508T18...
- 20230506T18...
- Fit range: [80...

Optical response transfer functions
(scaled by $1/C_R$)

Optical response resid
(measurement/model)

Sensing GPR

Legend:
- 20230521T191615Z
- 20230620T234012Z
- 20230616T161654Z
- 20230517T163625Z
- 2023020T02635Z
- 2023009T00754Z
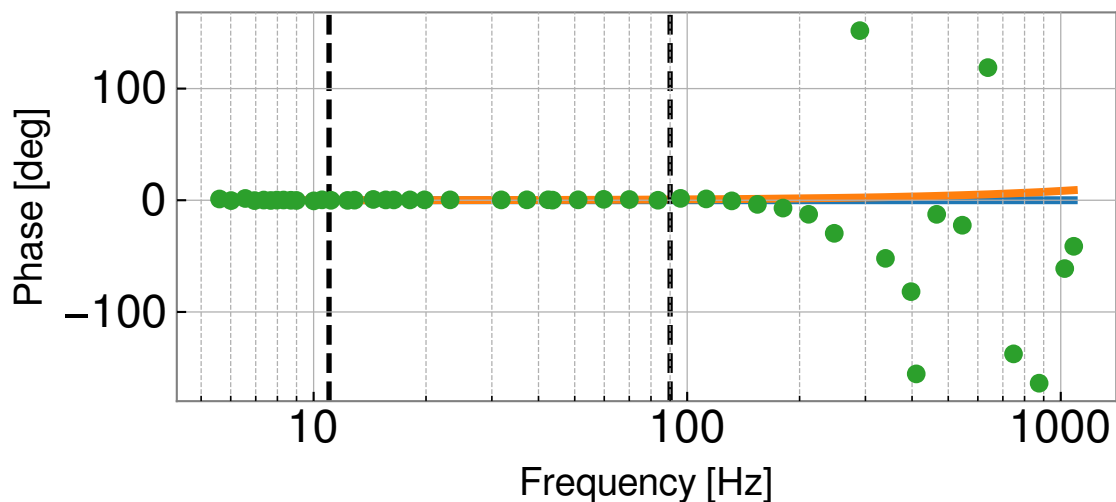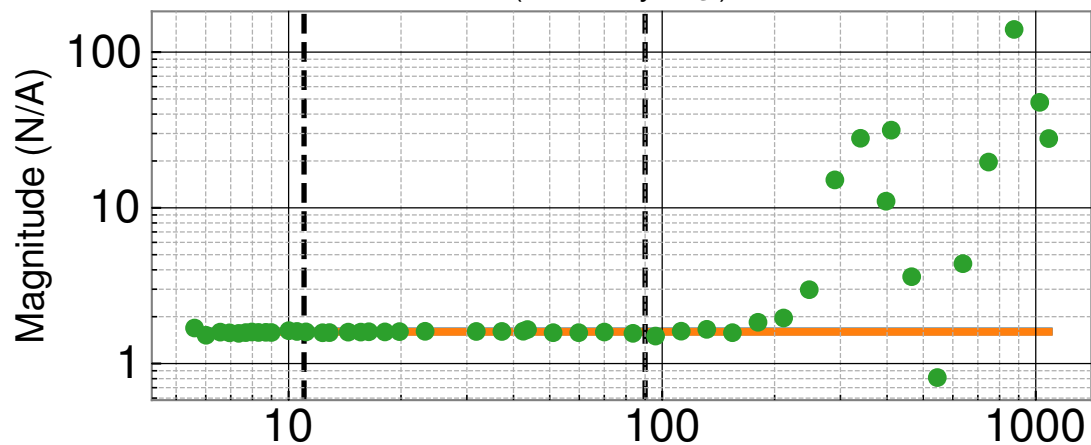- 202308T30014Z
- 20230506T182203Z

Median · 68% C.I.

H1SUSEX L1 actuation model MCMC summary

All fixed parameters drawn from /ligo/groups/cal/H1/reports/20230621T191615Z/pydarm_H1.ini

- Model w free params from report 20230621T191615Z
- Model w free params from MCMC fit to 20230517T154837Z data
- 20230517T154837Z measurement
- Fit

Actuation strength transfer functions (scaled by H_{ref})

Actuation strength resid (measurement/model w. free)

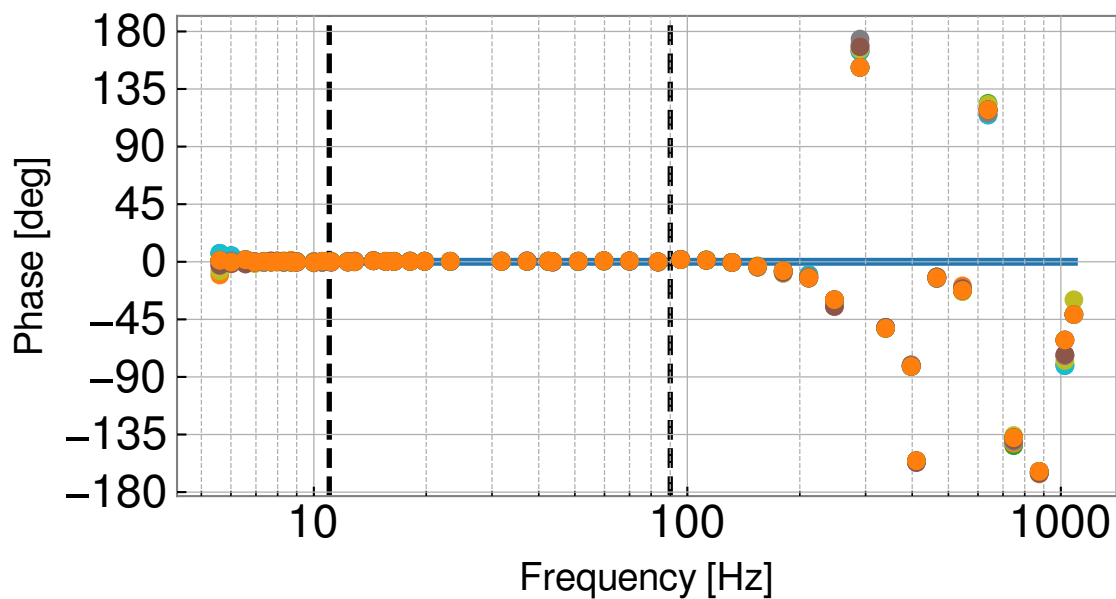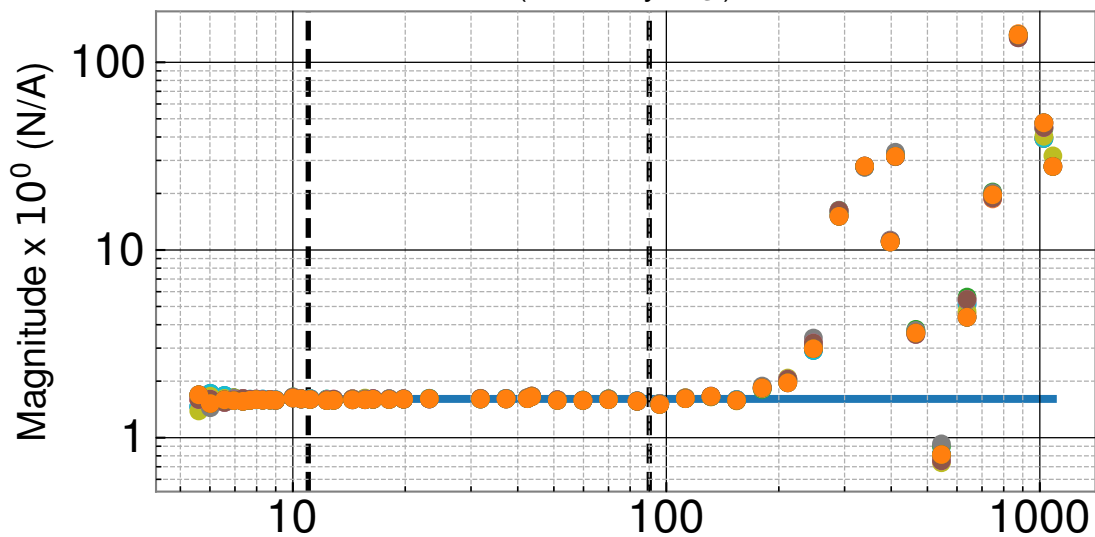| Parameter (value +/-)	value	+	-
Actuation Gain, Hau (N/A)	1.599	0.0008385 (0.05%)	0.0008356 (0.05%)
Residual time delay, tau_A (s)	-2.311e-05	1.917e-06 (-8.29%)	1.896e-06 (-8.20%)

20230517T154837Z EX L1 actuation
MCMC corner plot

2d pdf contours
1σ
2σ
3σ
map
(100 bins for 1d pdf)

$H_{UIM} = 1.599e + 00^{+8.385e-04}_{-8.356e-04}$

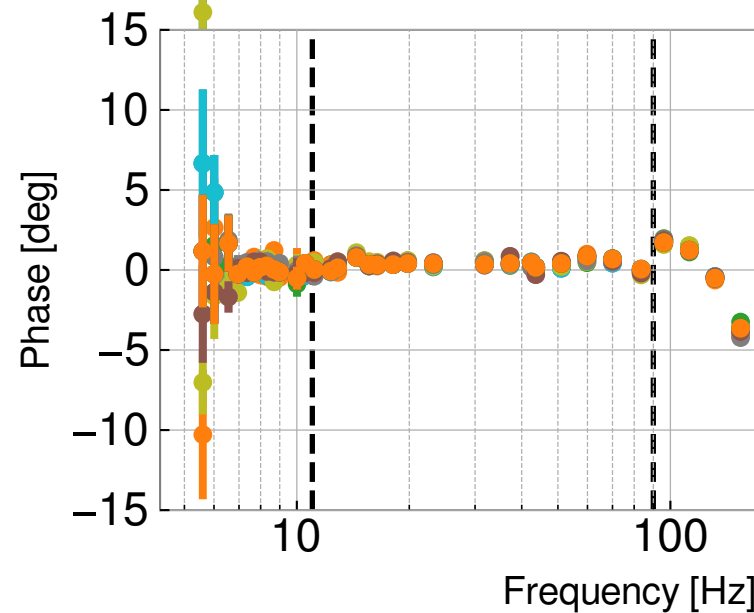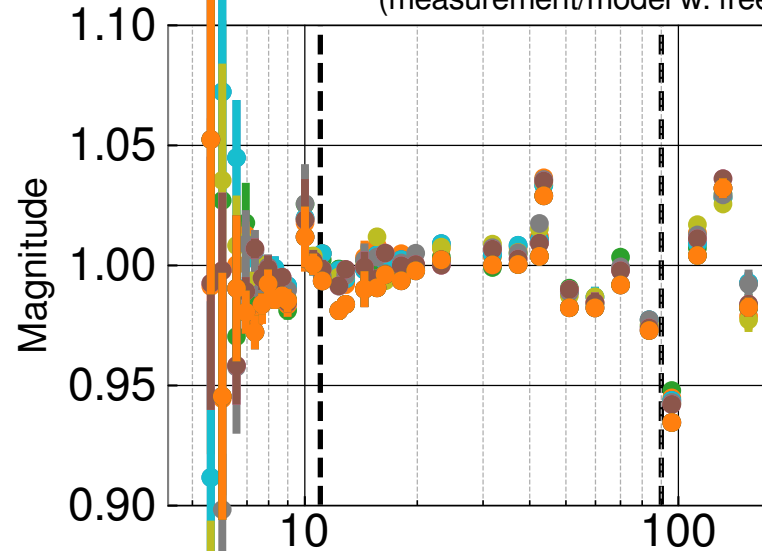$\Delta\tau_A = -2.311e - 05^{+1.917e-06}_{-1.896e-06}$
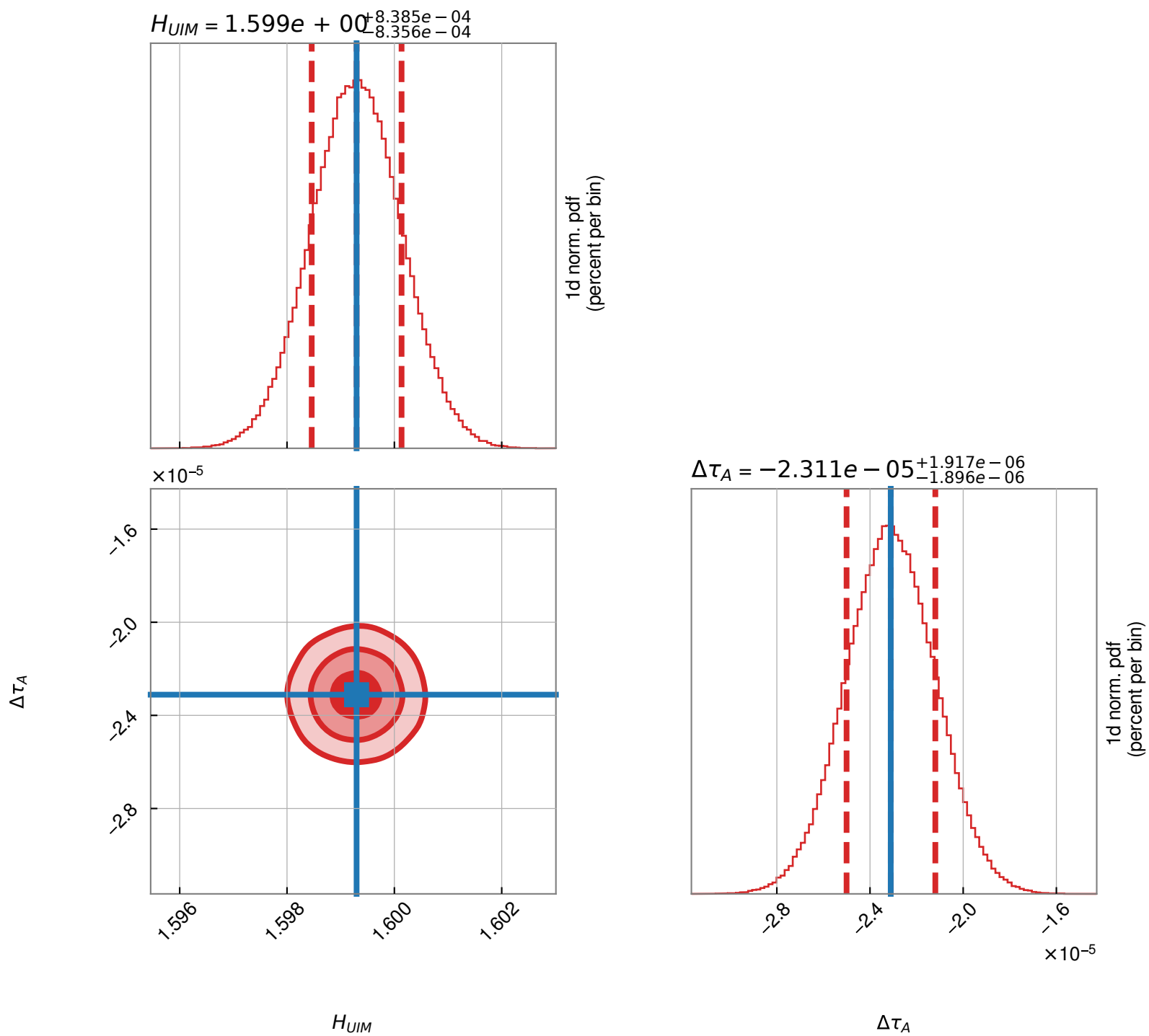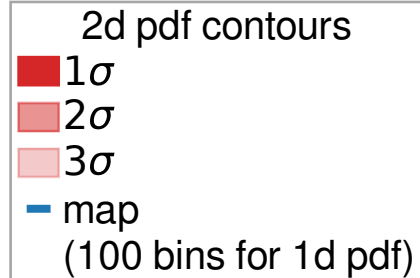
H1SUSEX L1 actuation model history

All fixed parameters drawn from /ligo/groups/cal/H1/reports/20230621T191615Z/pydarm_H1.ini

Legend:
- 20230510T062635Z model
- 20230517T154837Z measurement
- 20230517T154837Z measurement
- 20230517T154837Z measurement
- 20230517T154837Z measurement
- 20230509T062006Z measurement
- 20230509T062006Z measurement
- 20230508T171226Z measurement
- 20230506T173415Z measurement
- 20230505T165823Z measurement
- 20230505T16...
- 20230505T00...
- 20230504T05...
- MCMC Fit Ra...
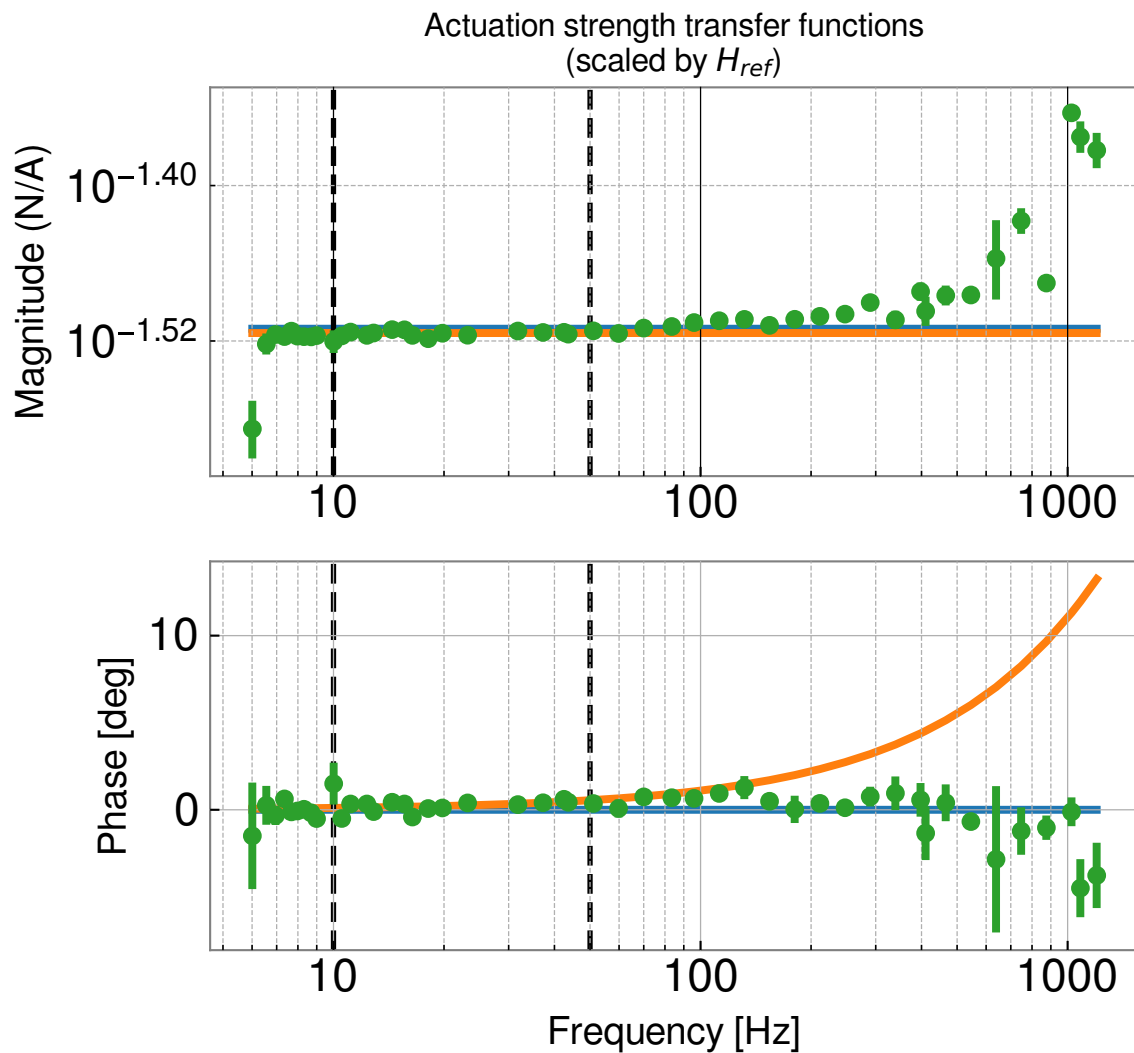
Actuation strength transfer functions (scaled by H_{ref})

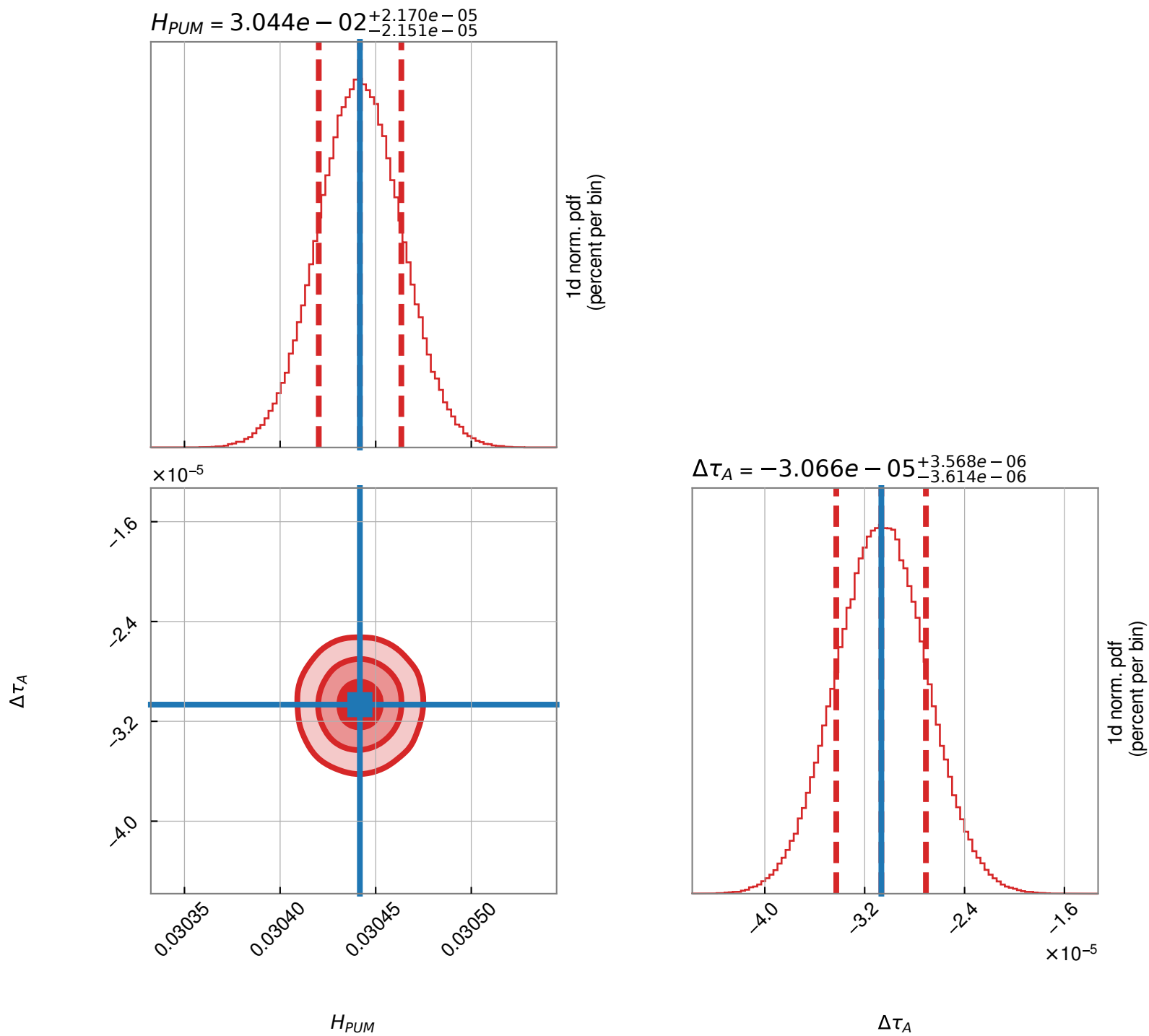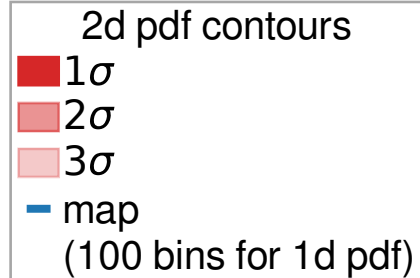Actuation strength residuals (measurement/model w. free...)

H1SUSEX L2 actuation model MCMC summary

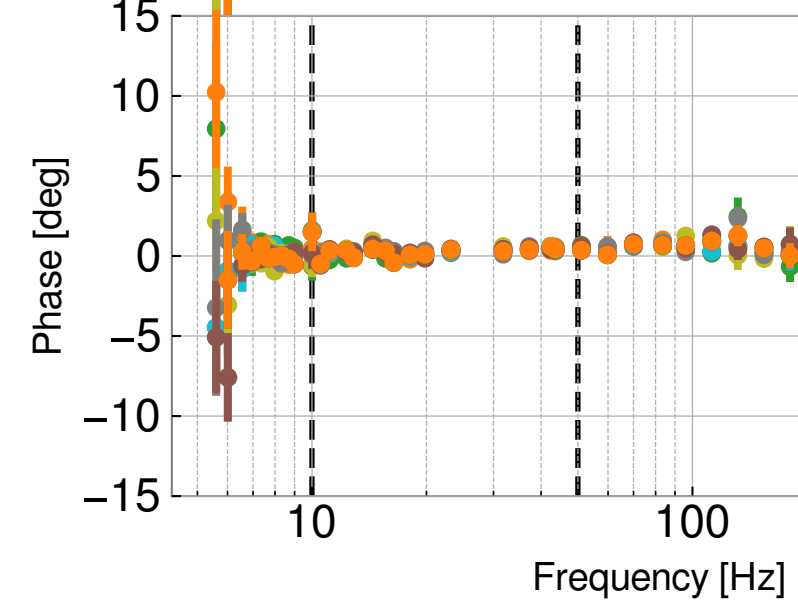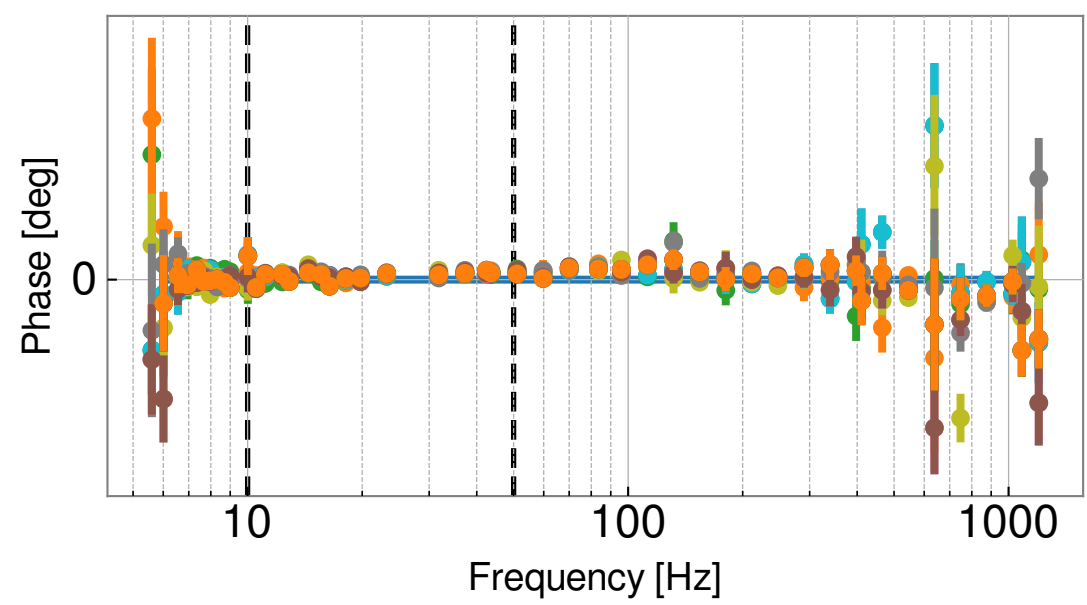All fixed parameters drawn from /ligo/groups/cal/H1/reports/20230621T191615Z/pydarm_H1.ini
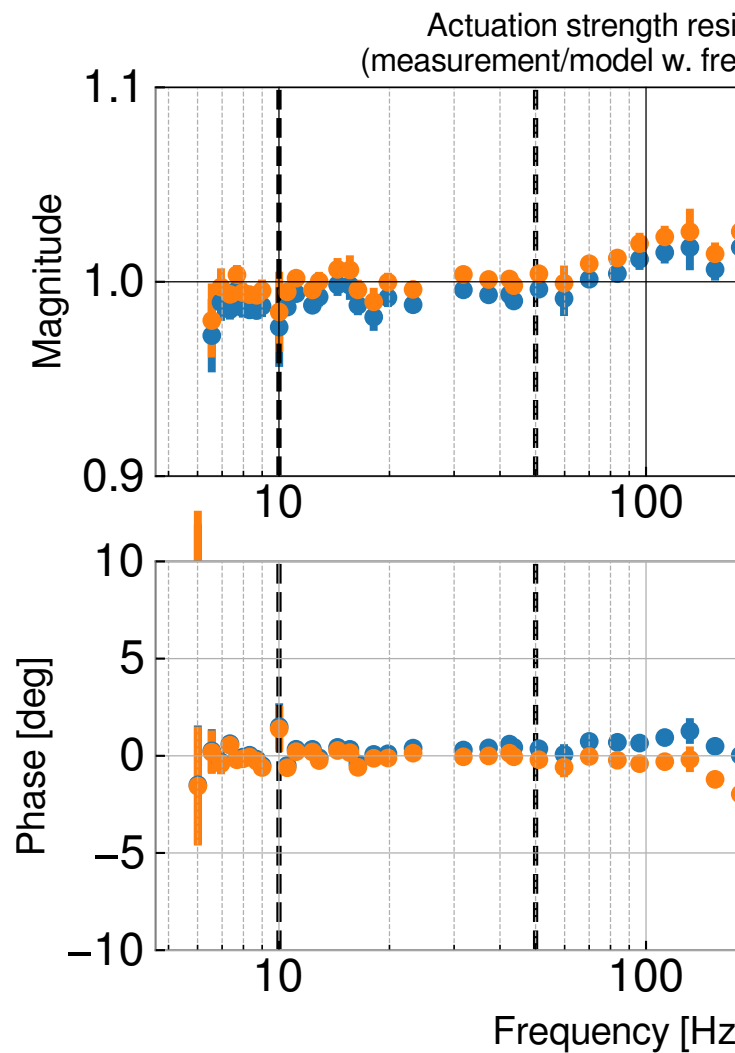
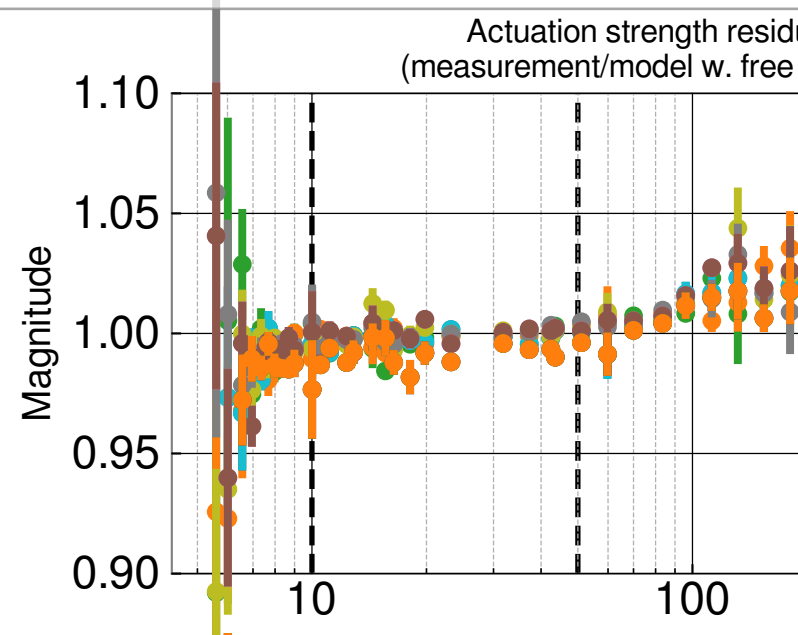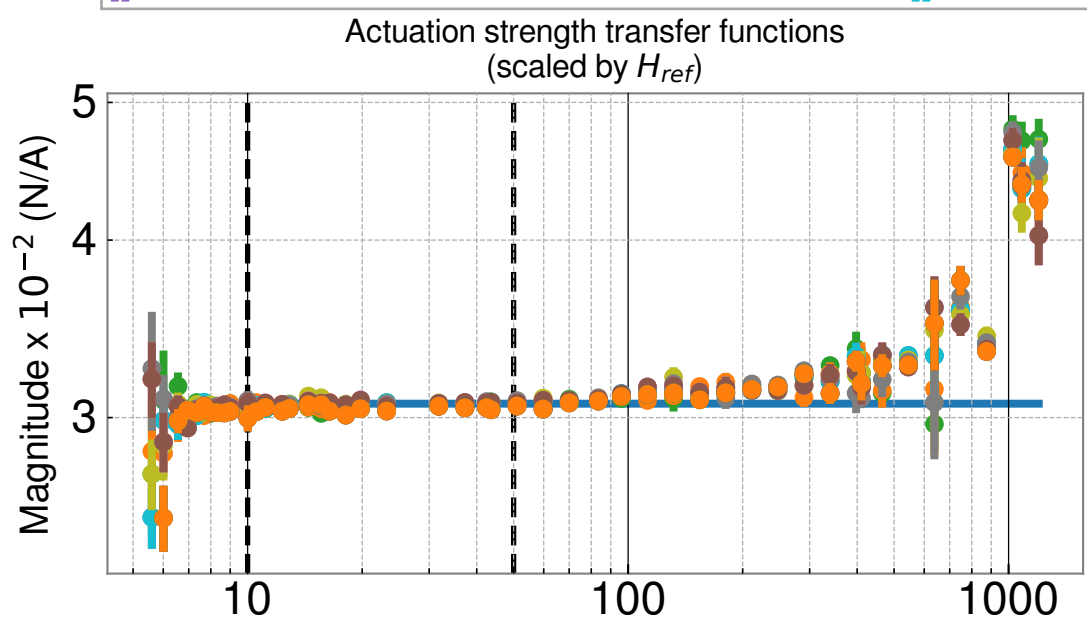| Parameter (value +/-)	value	+	-
Actuation Gain, Hap (N/A)	0.03044	2.17e-05 (0.07%)	2.151e-05 (0.07%)
Residual time delay, tau_A (s)	-3.066e-05	3.568e-06 (-11.64%)	3.614e-06 (-11.79%)

20230517T161131Z EX L2 actuation
MCMC corner plot

$H_{PUM} = 3.044e-02^{+2.170e-05}_{-2.151e-05}$

$\Delta\tau_A = -3.066e-05^{+3.568e-06}_{-3.614e-06}$

2d pdf contours
1σ
2σ
3σ
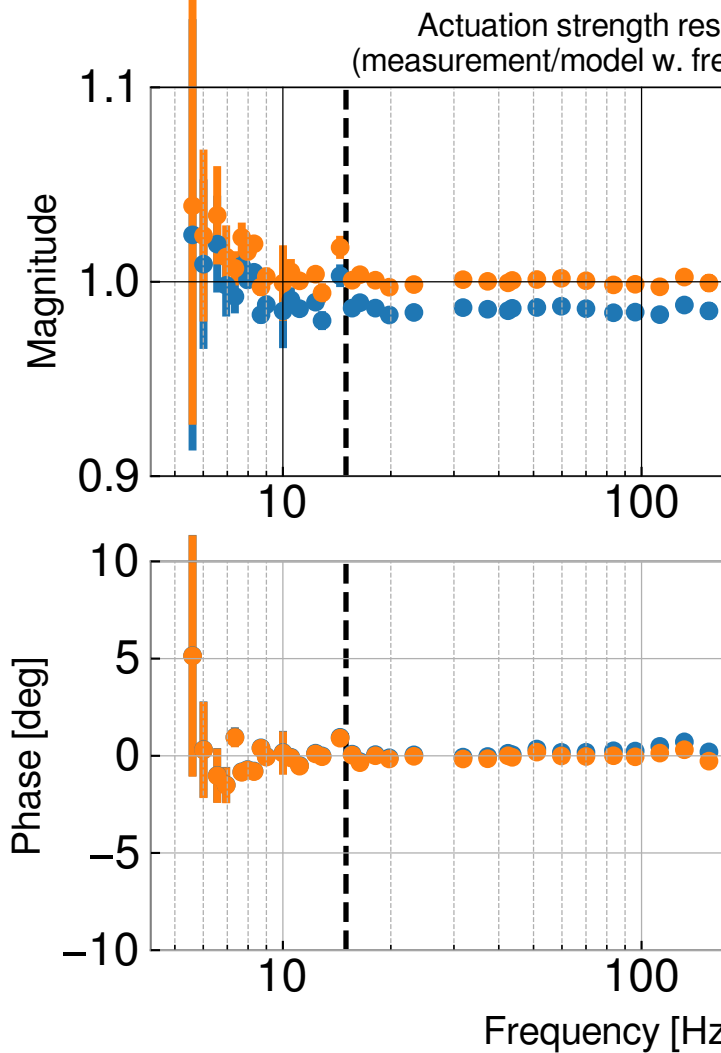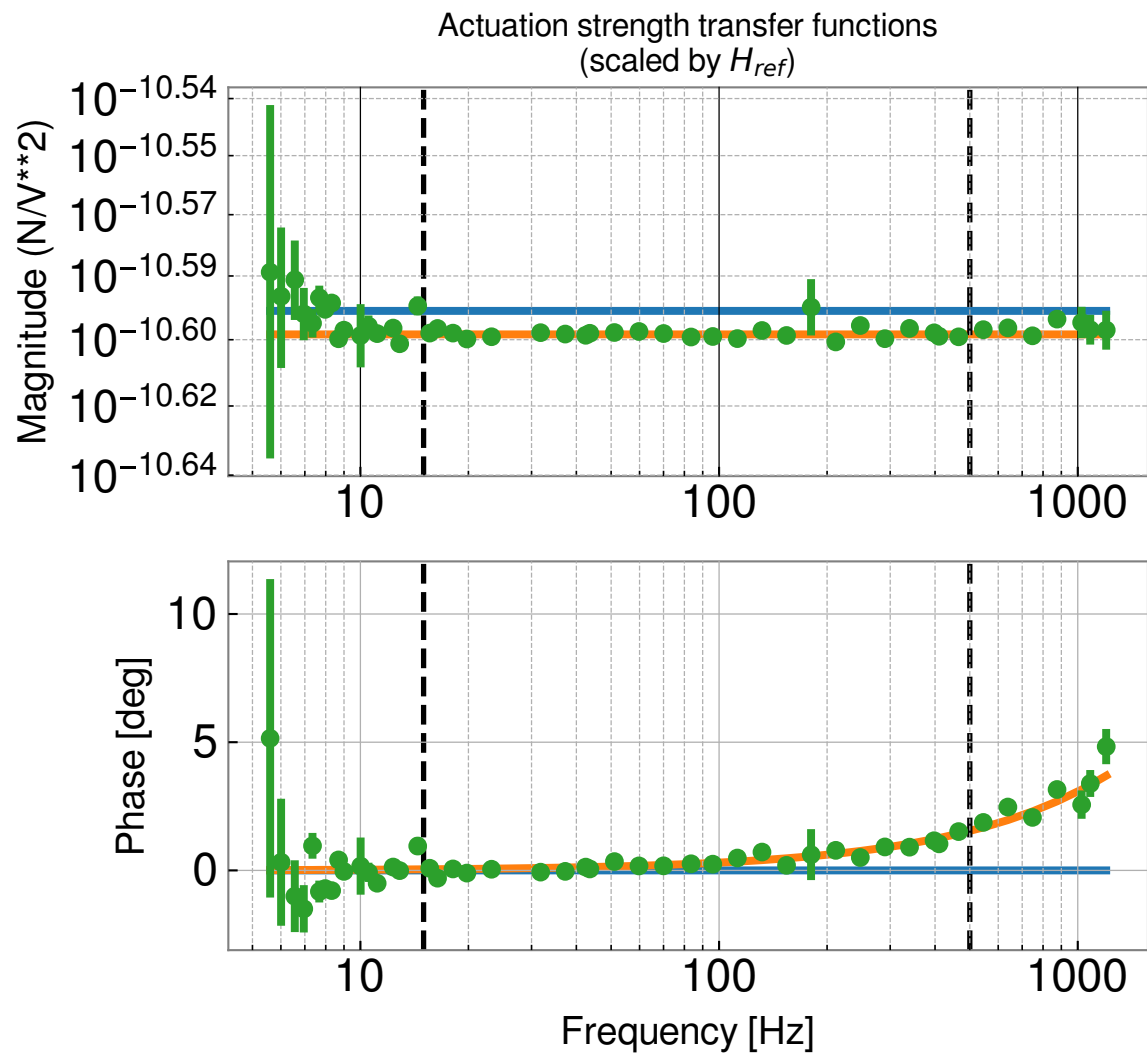map
(100 bins for 1d pdf)

1d norm. pdf (percent per bin)

H1SUSEX L2 actuation model history

All fixed parameters drawn from /ligo/groups/cal/H1/reports/20230621T191615Z/pydarm_H1.ini

- 20230510T062635Z model
- 20230517T161131Z measurement
- 20230517T161131Z measurement
- 20230517T161131Z measurement
- 20230517T161131Z measurement
- 20230509T064300Z measurement
- 20230509T064300Z measurement
- 20230508T173520Z measurement
- 20230506T175709Z measurement
- 20230505T172117Z measurement
- 20230505T17
- 20230505T01
- 20230504T05
- MCMC Fit Ra

Actuation strength transfer functions (scaled by H_{ref})

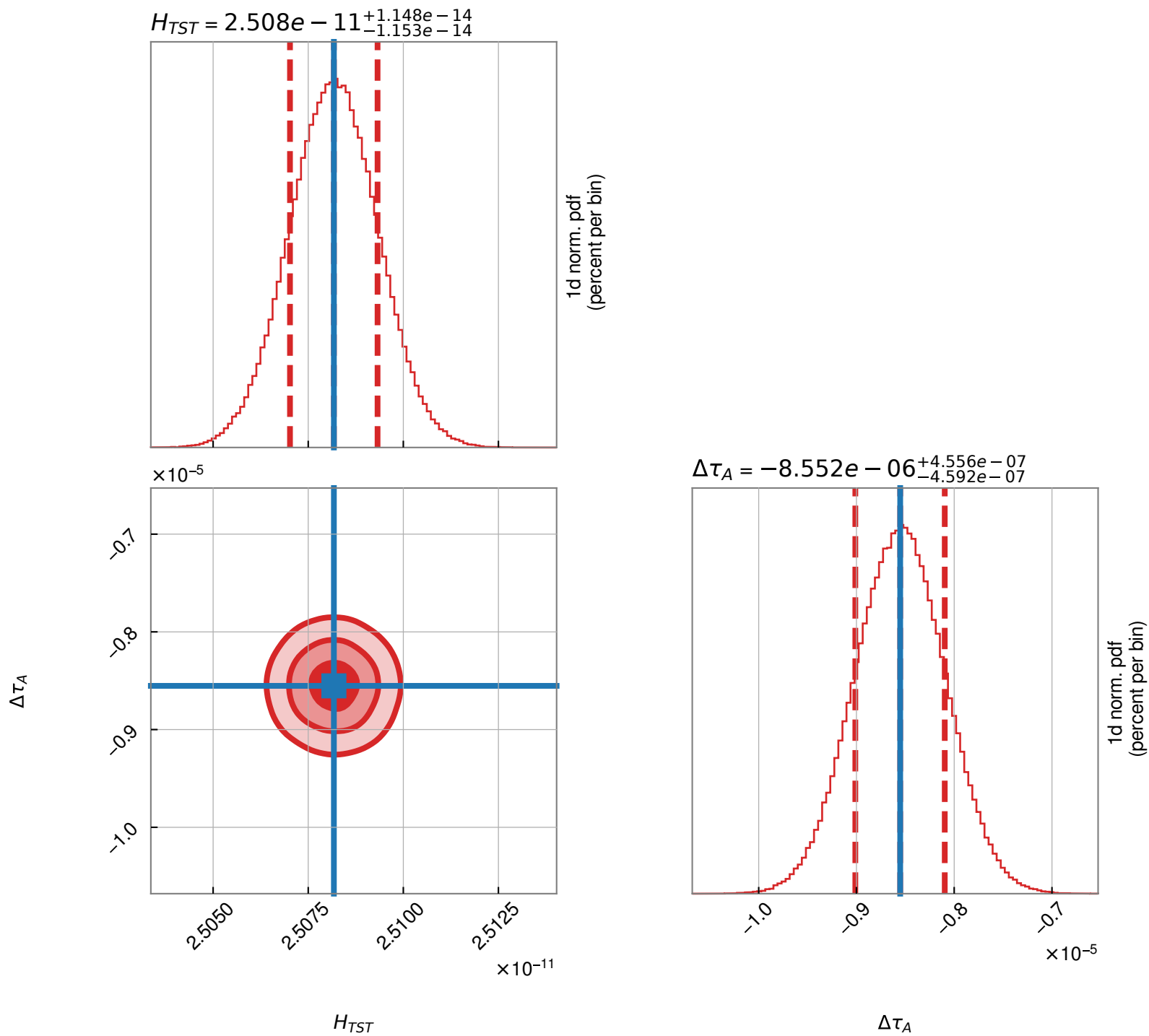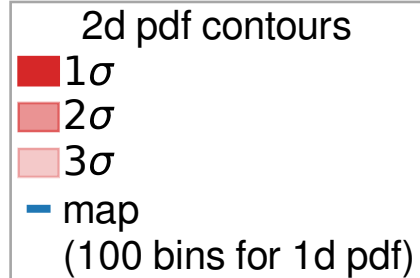### Actuation strength residu (measurement/model w. free

H1SUSEX L3 actuation model MCMC summary

All fixed parameters drawn from /ligo/groups/cal/H1/reports/20230621T191615Z/pydarm_H1.ini

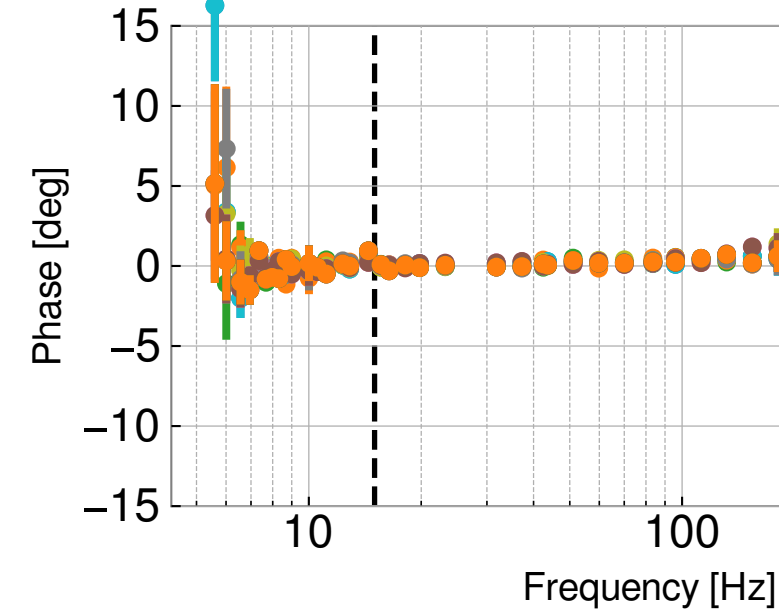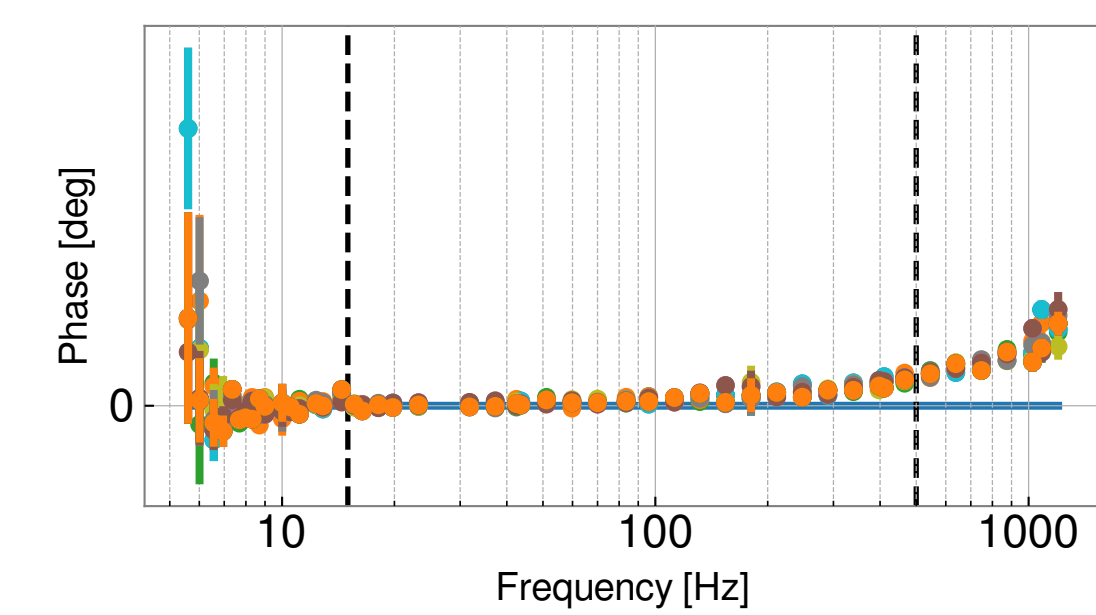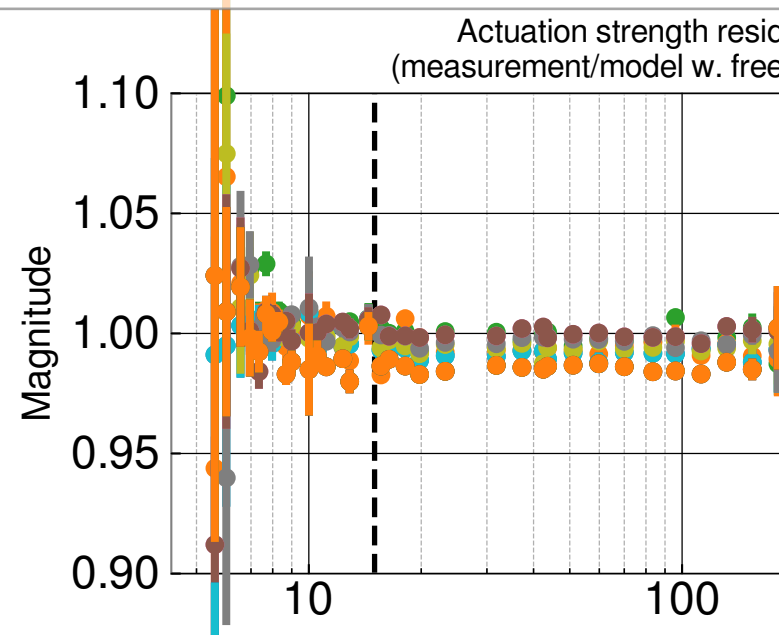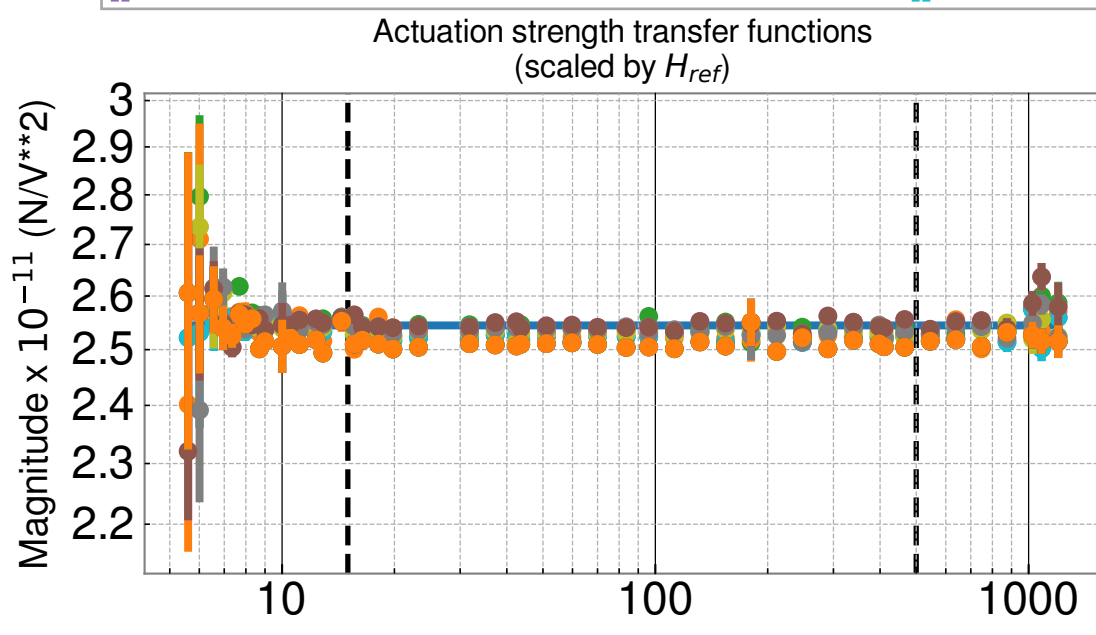| Parameter	(value +/-)	value	+	-
Actuation Gain, Hat (N/V**2)		2.508e-11	1.148e-14 (0.05%)	1.153e-14 (0.05%)
Residual time delay, tau_A (s)		-8.552e-06	4.556e-07 (-5.33%)	4.592e-07 (-5.37%)

20230517T163635Z EX L3 actuation
MCMC corner plot

$H_{TST} = 2.508e-11^{+1.148e-14}_{-1.153e-14}$

$\Delta\tau_A = -8.552e-06^{+4.556e-07}_{-4.592e-07}$

2d pdf contours
- 1σ
- 2σ
- 3σ
- map
(100 bins for 1d pdf)
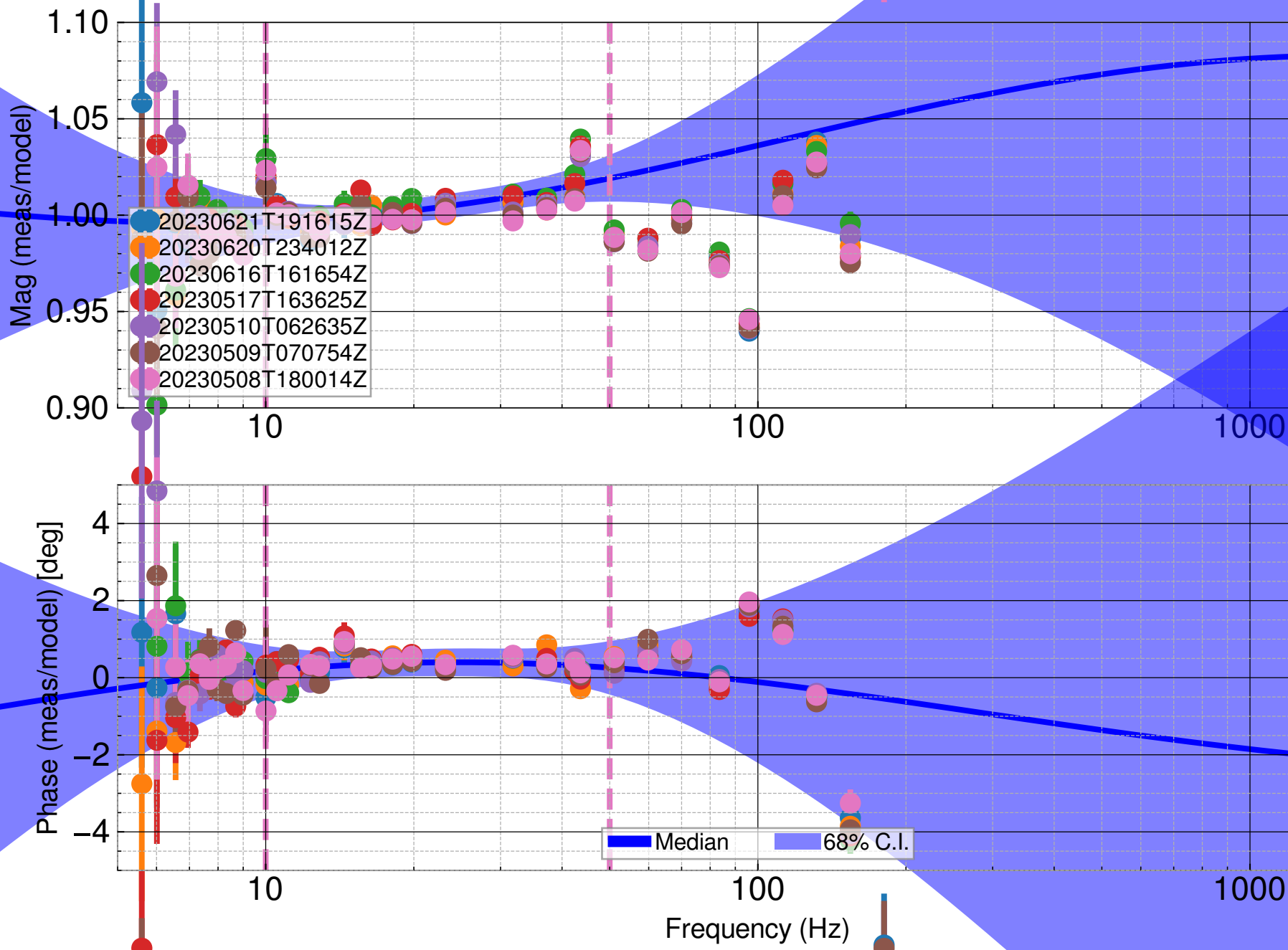
1d norm. pdf (percent per bin)

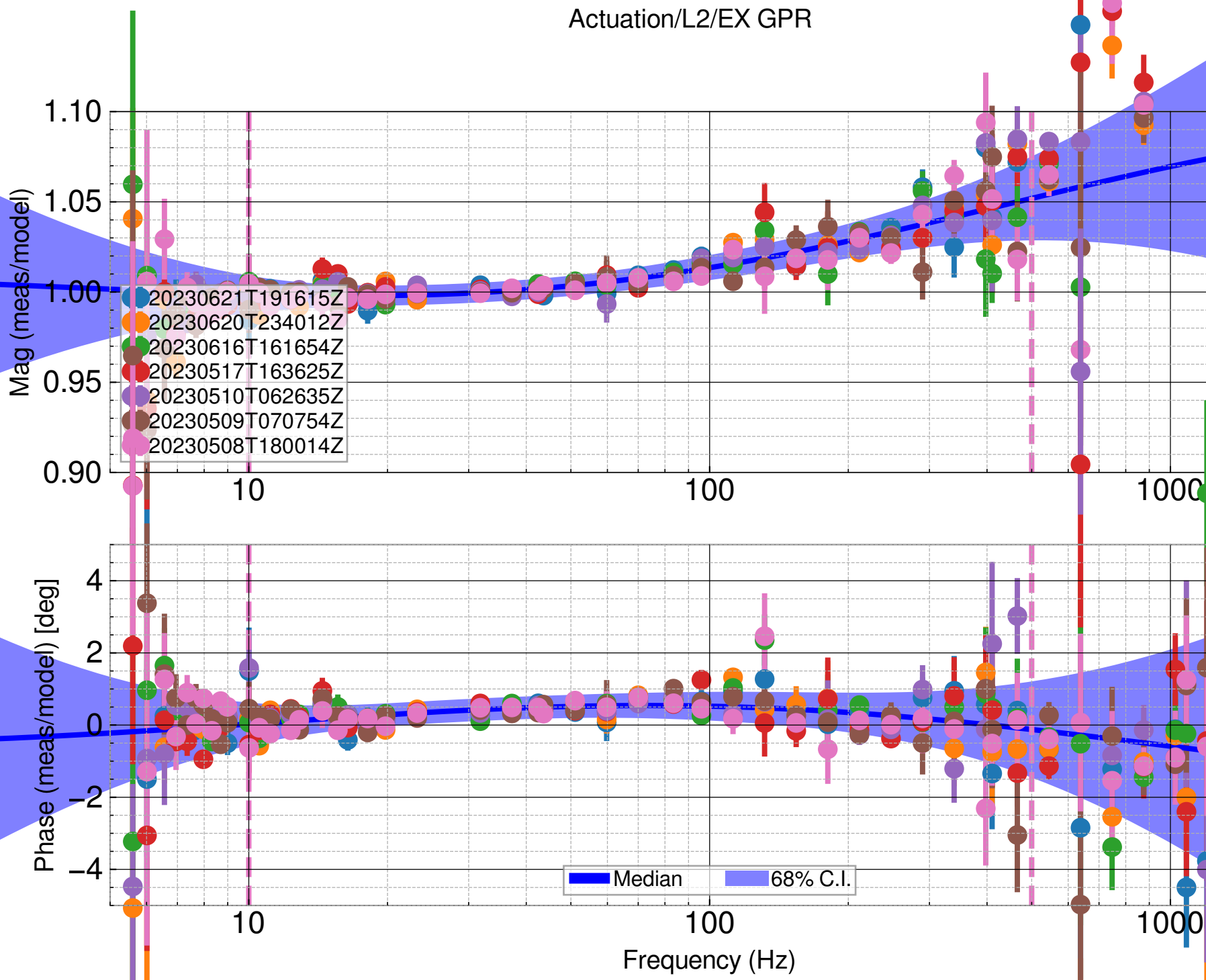$\Delta\tau_A$

H_{TST}

H1SUSEX L3 actuation model history

All fixed parameters drawn from /ligo/groups/cal/H1/reports/20230621T191615Z/pydarm_H1.ini

- 20230510T062635Z model
- 20230517T163635Z measurement
- 20230517T163635Z measurement
- 20230517T163635Z measurement
- 20230517T163635Z measurement
- 20230509T070804Z measurement
- 20230509T070804Z measurement
- 20230508T180024Z measurement
- 20230506T182213Z measurement
- 20230505T174621Z measurement
- 20230505T17...
- 20230505T01...
- 20230504T05...
- MCMC Fit Ra...

Actuation strength transfer functions
(scaled by H_{ref})

Actuation strength resid...
(measurement/model w. free...)

Actuation/L1/EX GPR

Actuation/L2/EX GPR

Legend:
- 20230621T191615Z
- 20230620T234012Z
- 20230616T161654Z
- 20230517T163625Z
- 20230510T062635Z
- 20230509T070754Z
- 20230508T180014Z
- Median
- 68% C.I.

Actuation/L3/EX GPR

Legend:
- 20230621T191615Z
- 20230620T234012Z
- 20230616T161654Z
- 20230517T163625Z
- 20230510T062635Z
- 20230509T070754Z
- 20230508T180014Z

Median — 68% C.I.
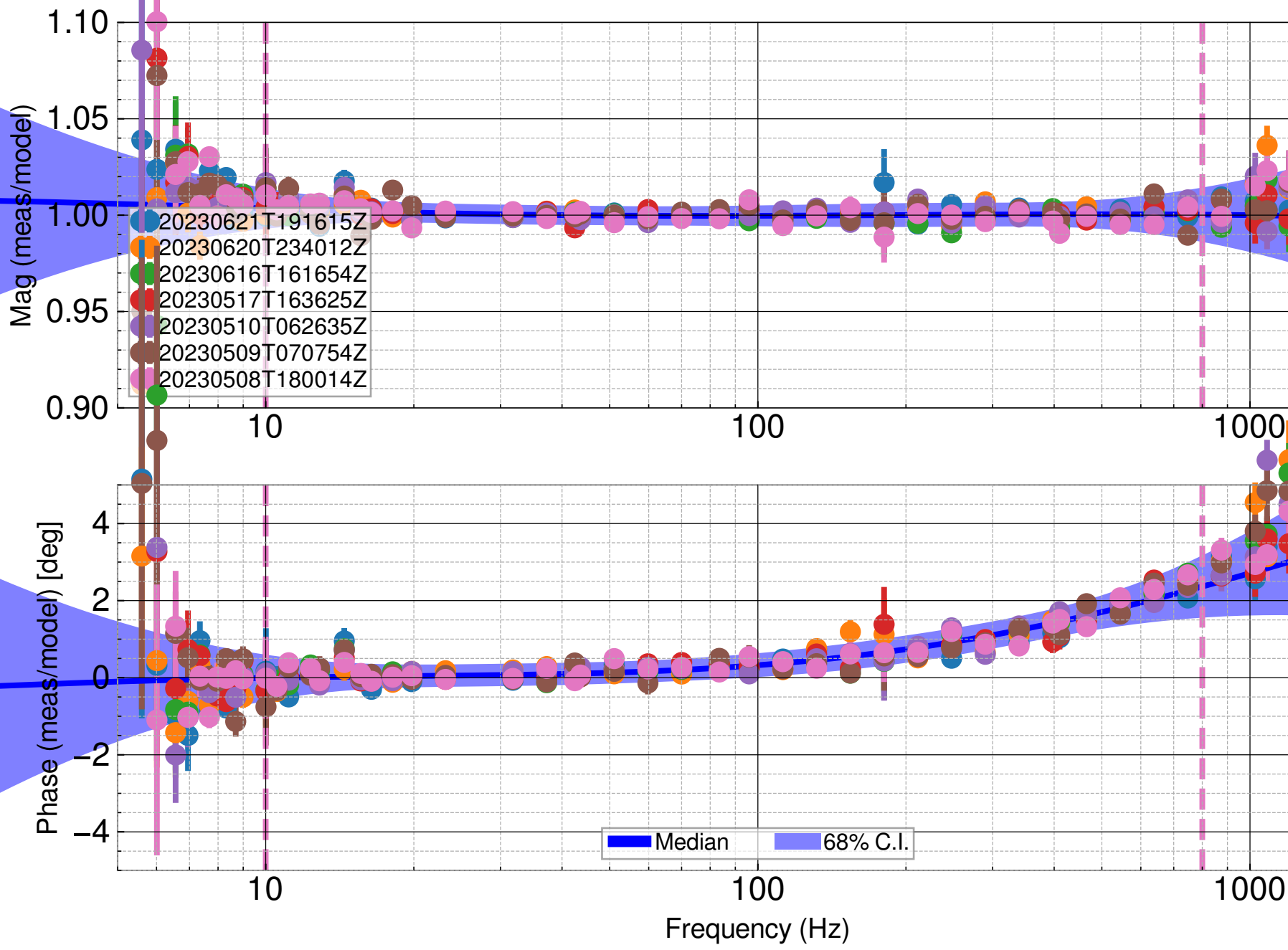
Residual corrections comparison (gstlal_compute_strain_C00_filters_H1)
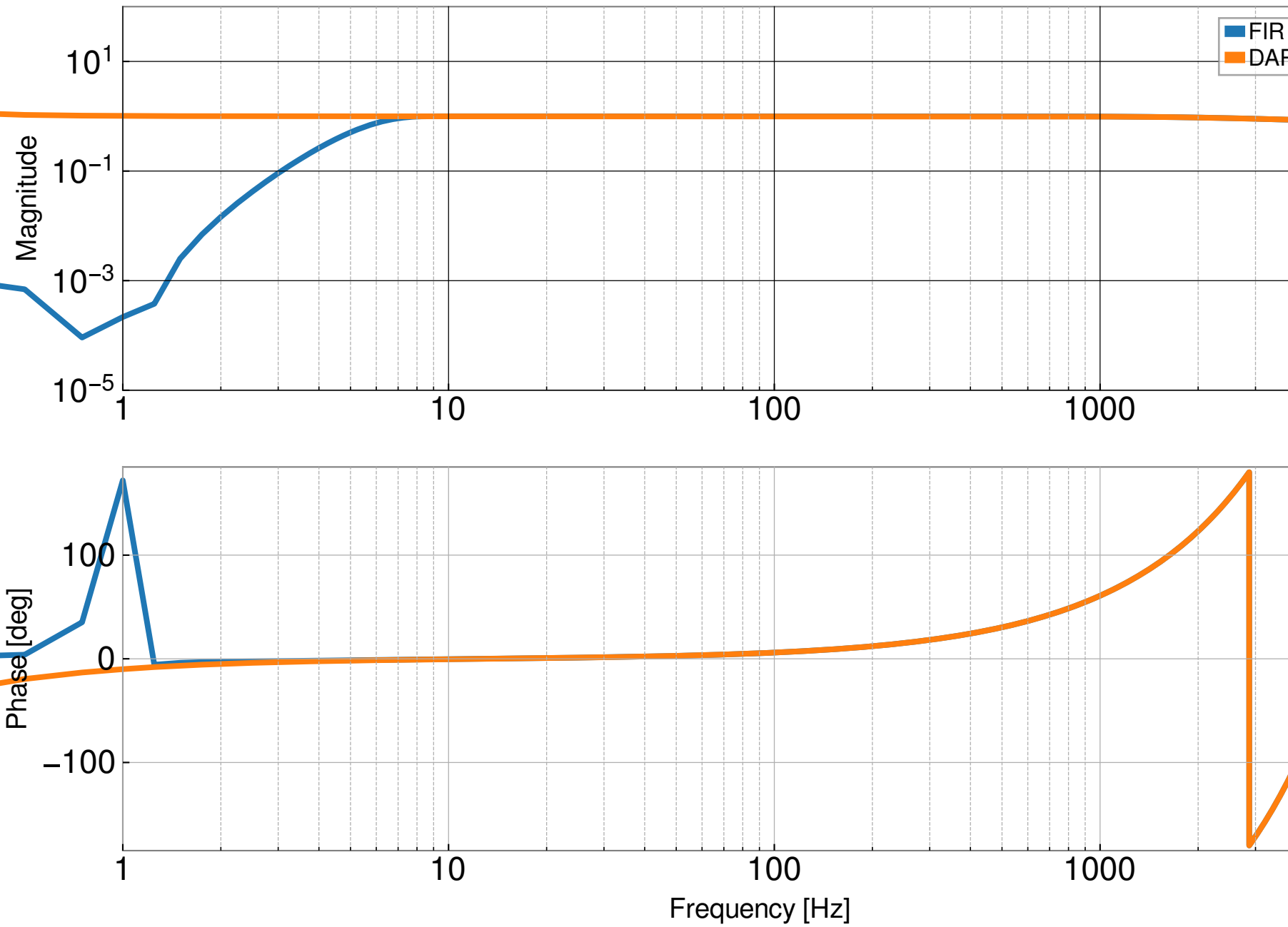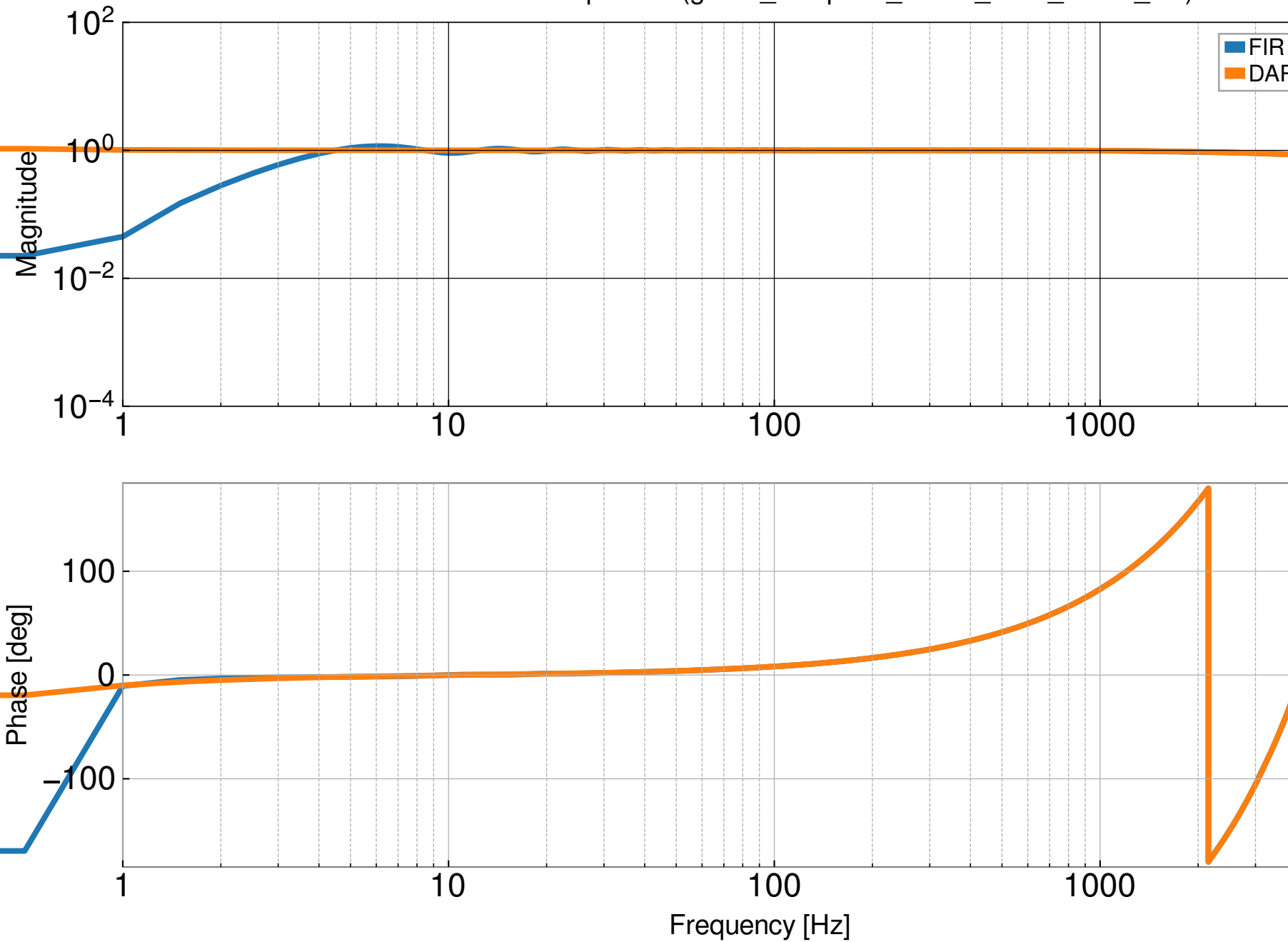
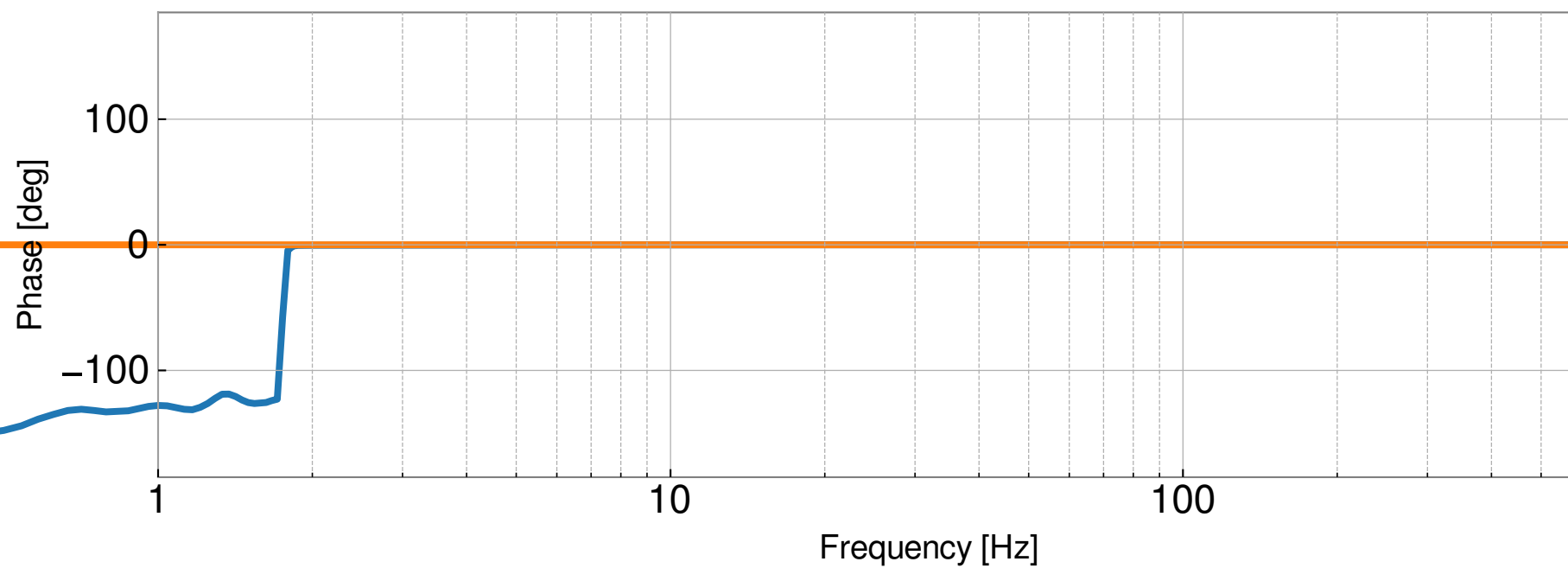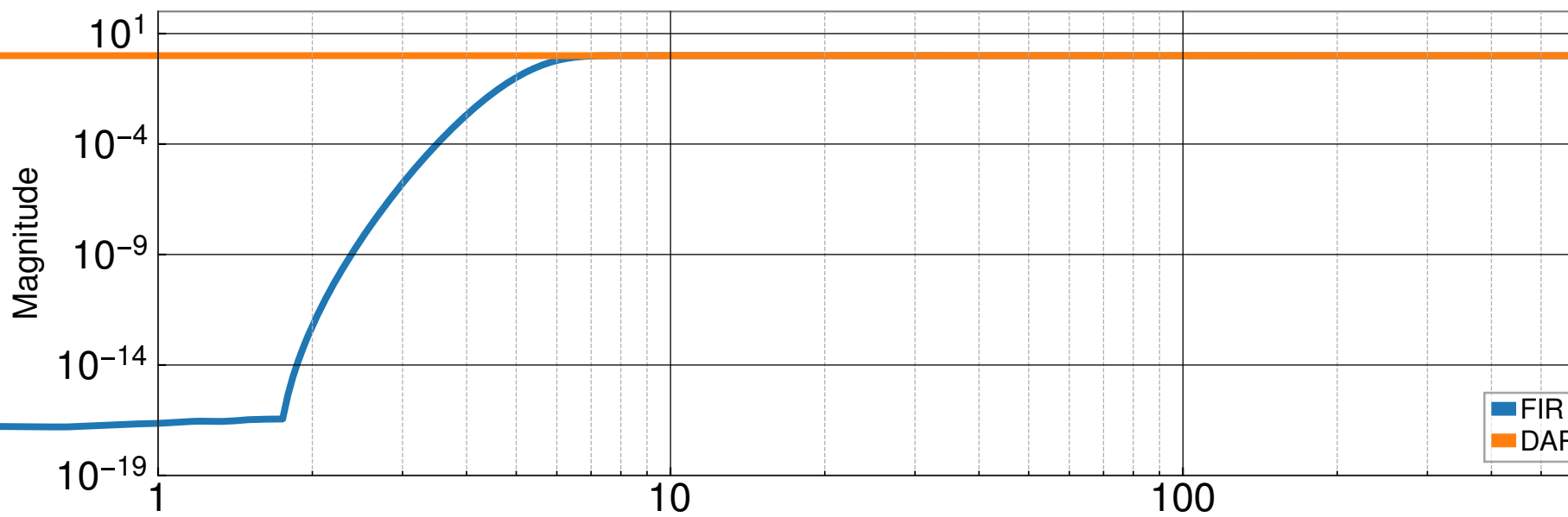Res Corr No CC Pole comparison (gstlal_compute_strain_C00_filters_H1)
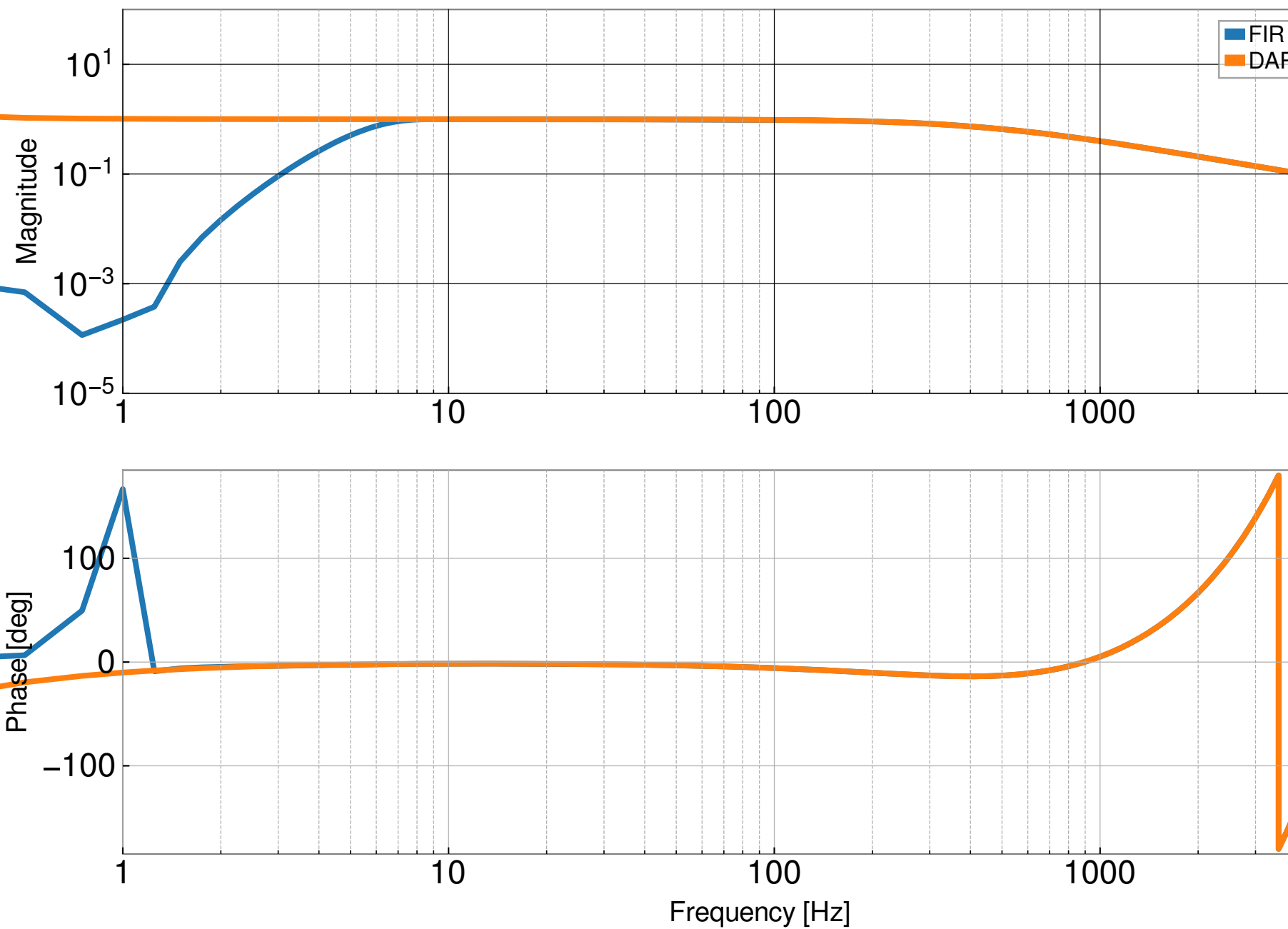
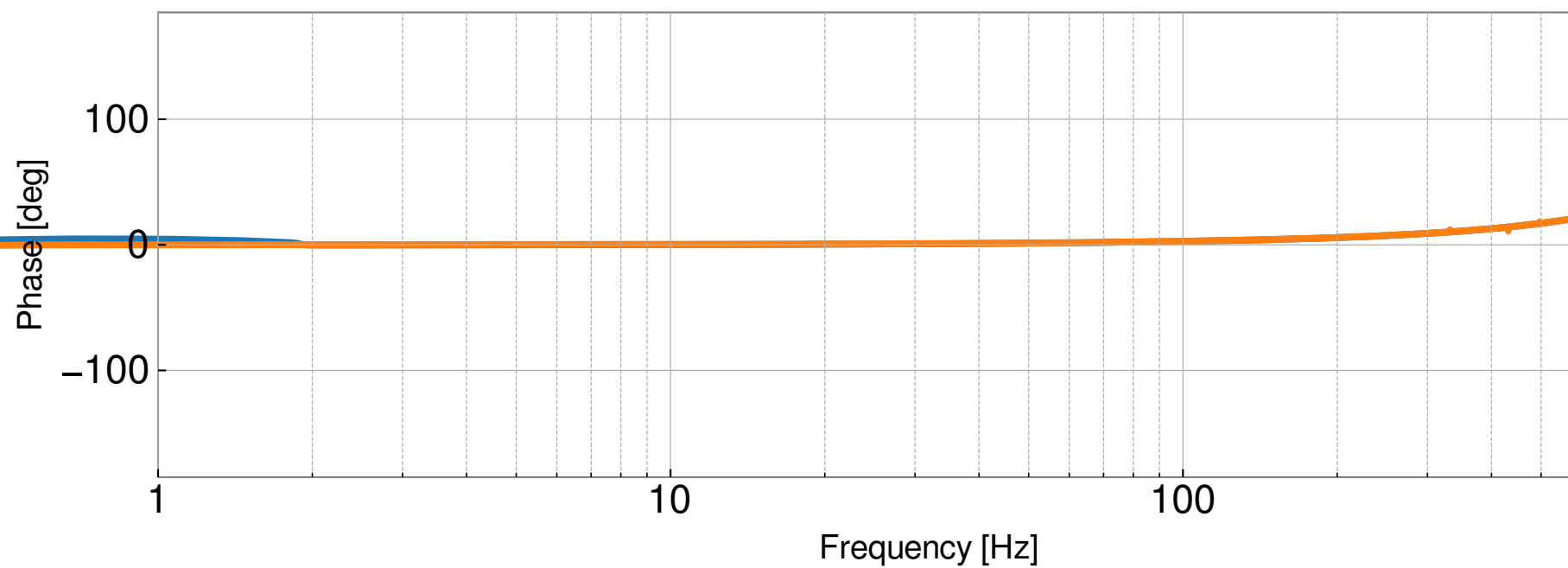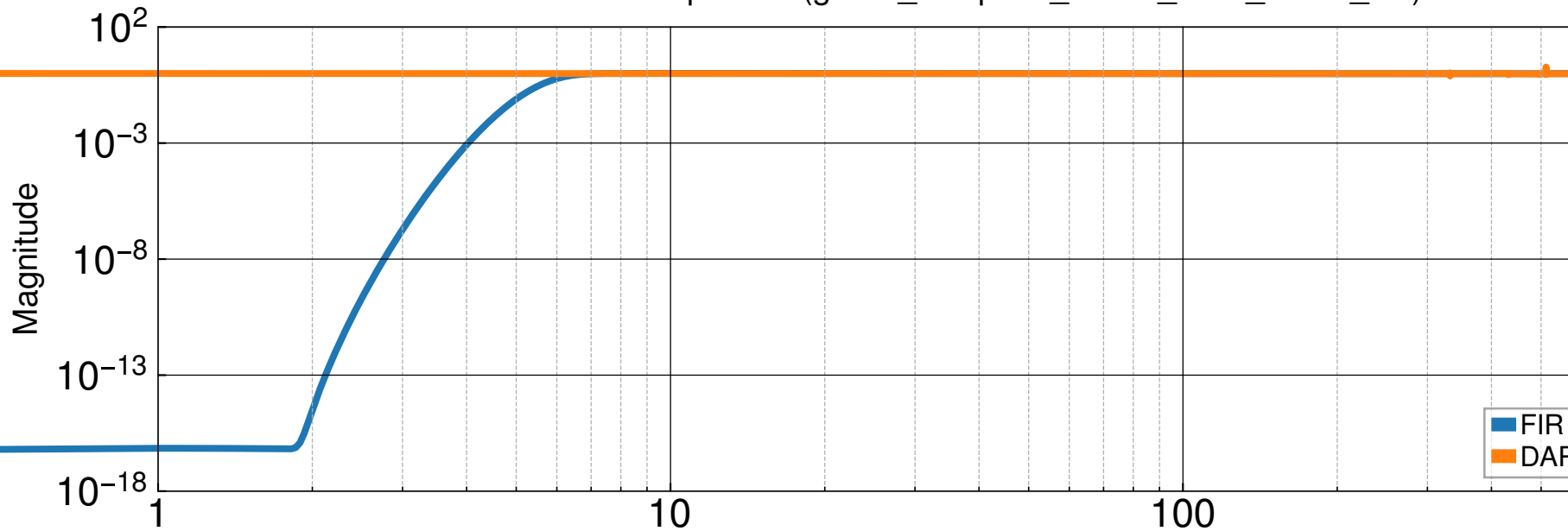Res Corr No Pole comparison (gstlal_compute_strain_C00_filters_H1)
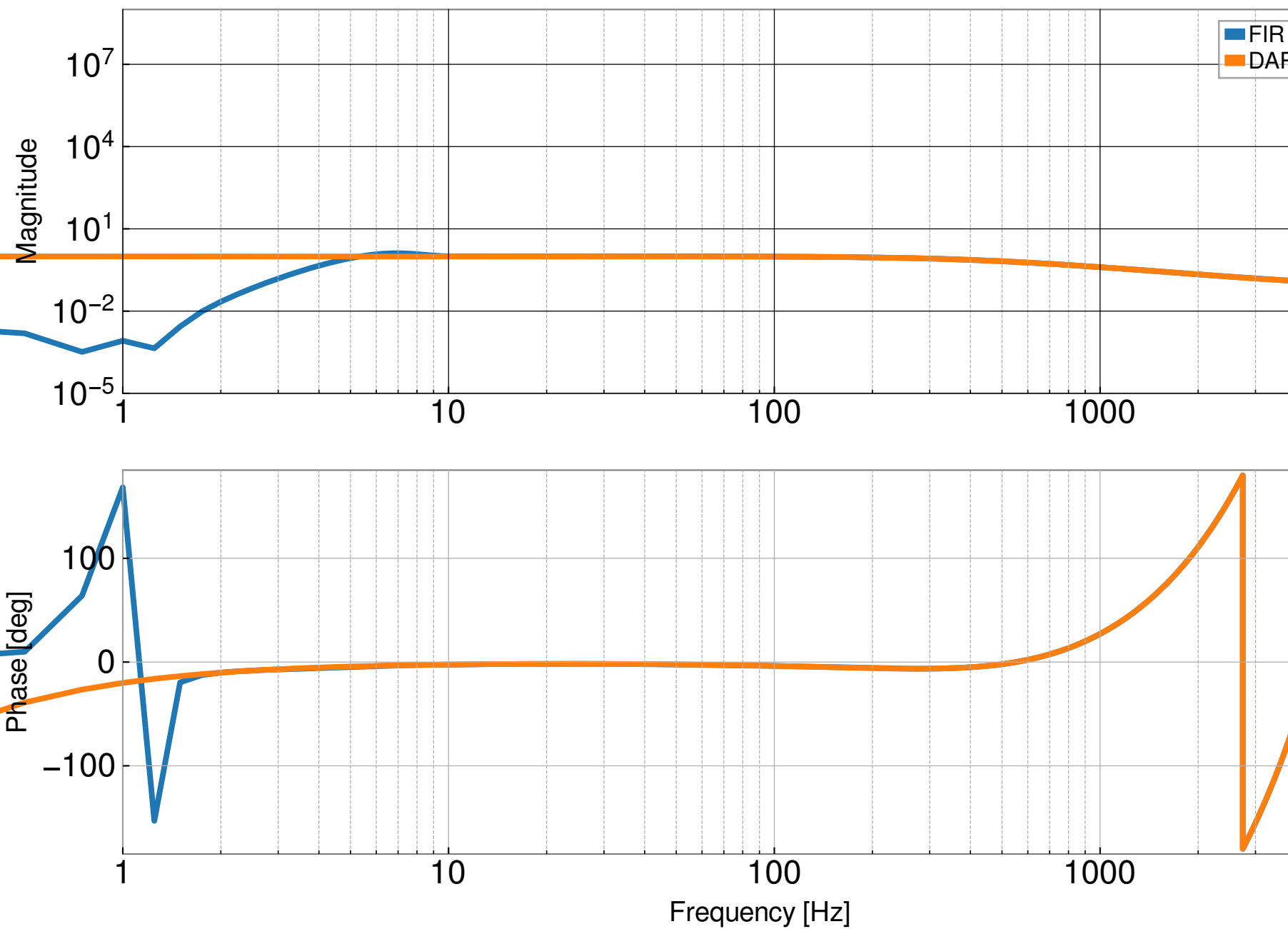
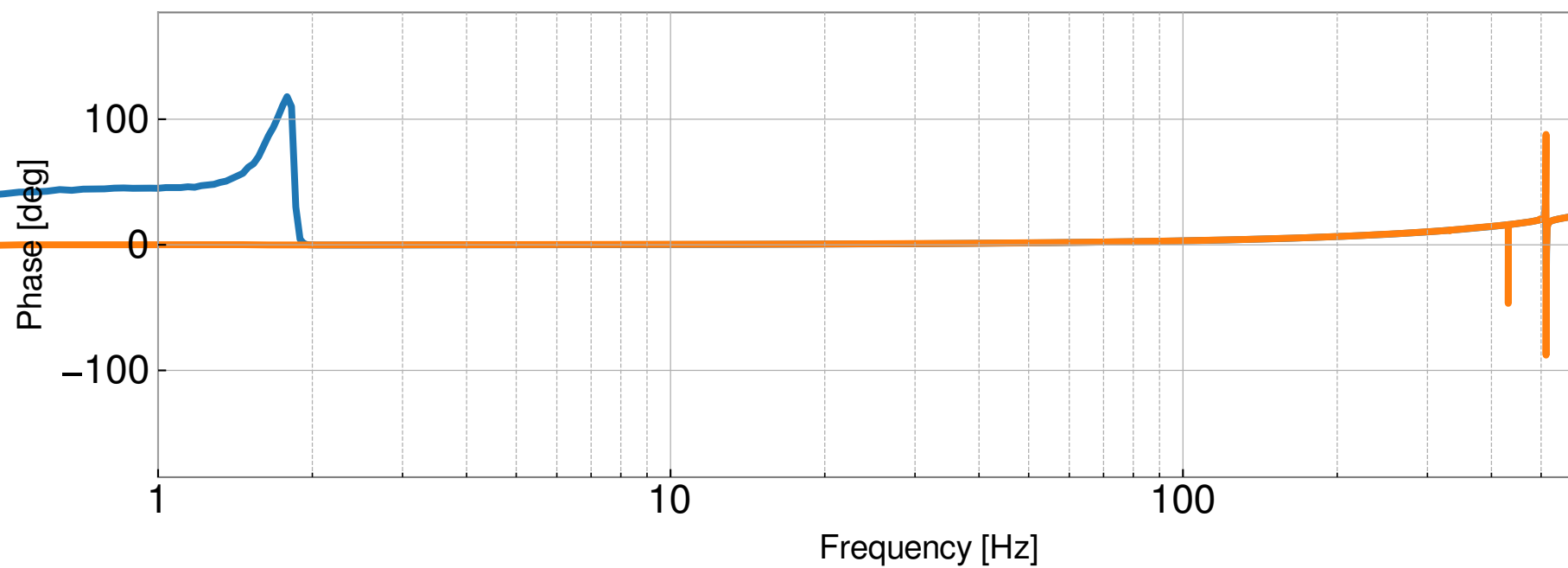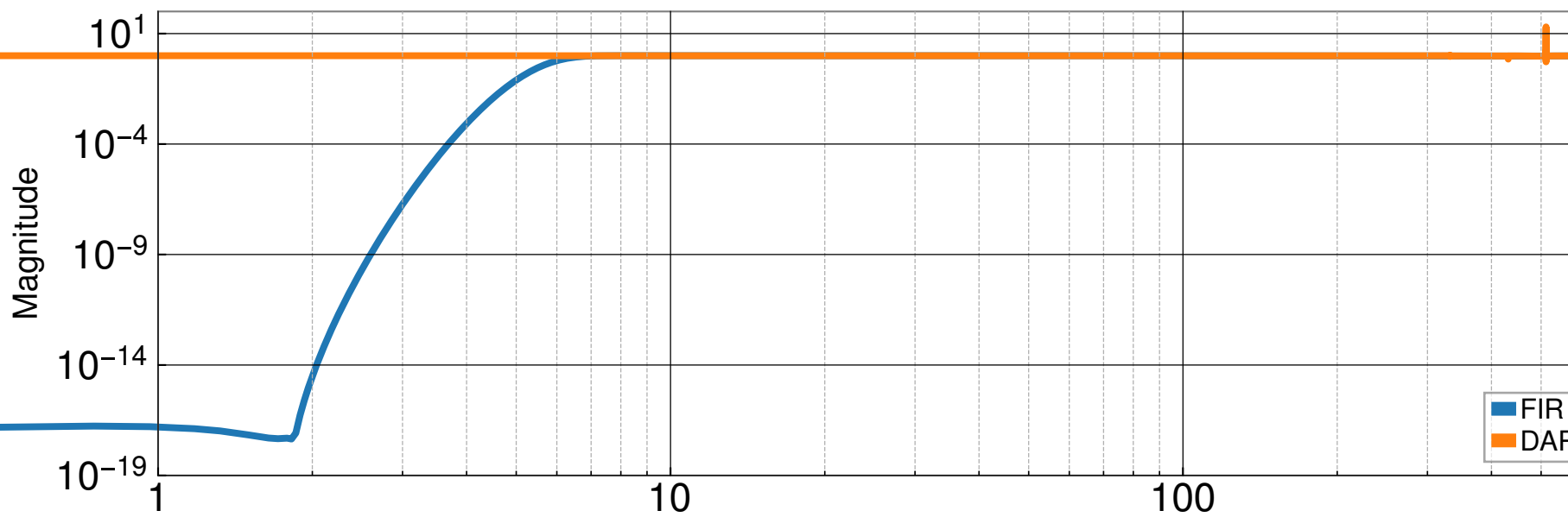Nonsens corrections comparison (gstlal_compute_strain_C00_filters_H1)

Residual corrections highpass comparison (gstlal_compute_strain_C00_filters_H1)

TST corrections comparison (gstlal_compute_strain_C00_filters_H1)

PUM corrections comparison (gstlal_compute_strain_C00_filters_H1)

UIM corrections comparison (gstlal_compute_strain_C00_filters_H1)