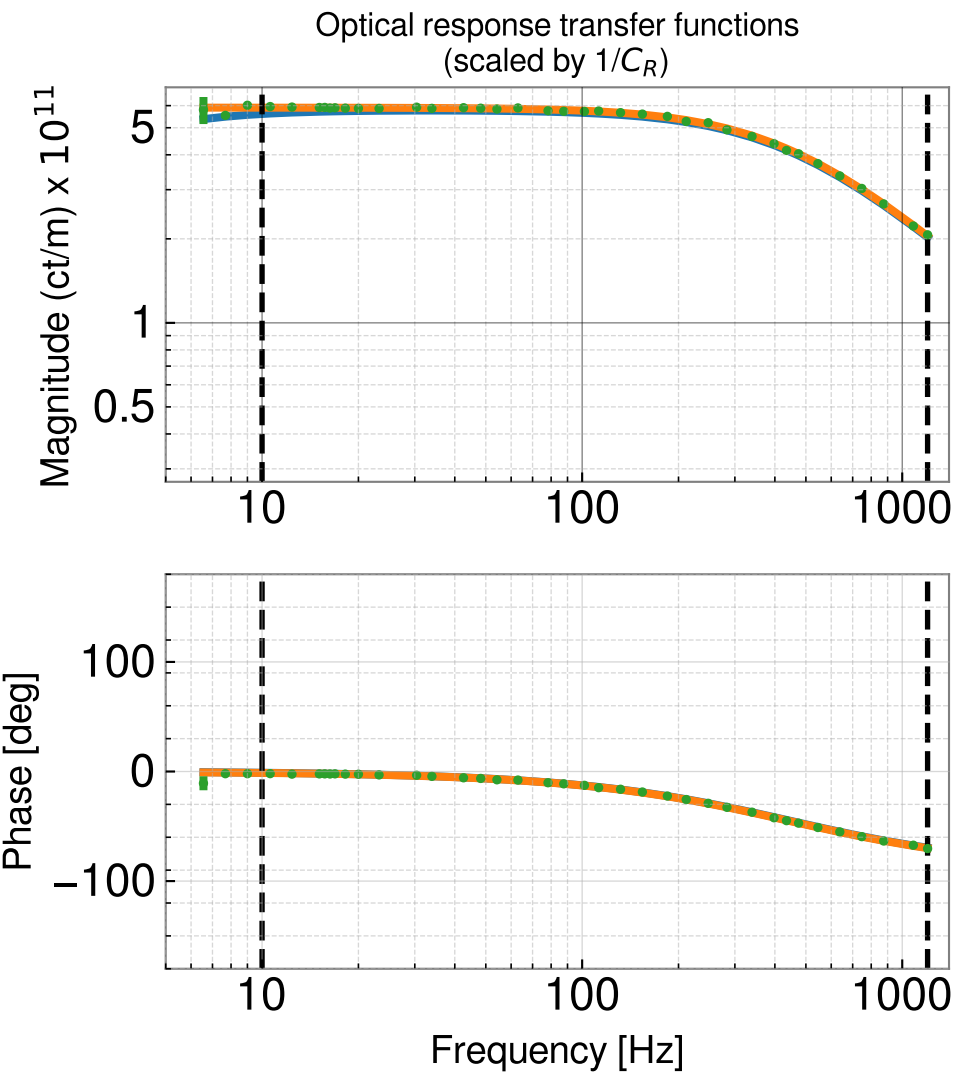
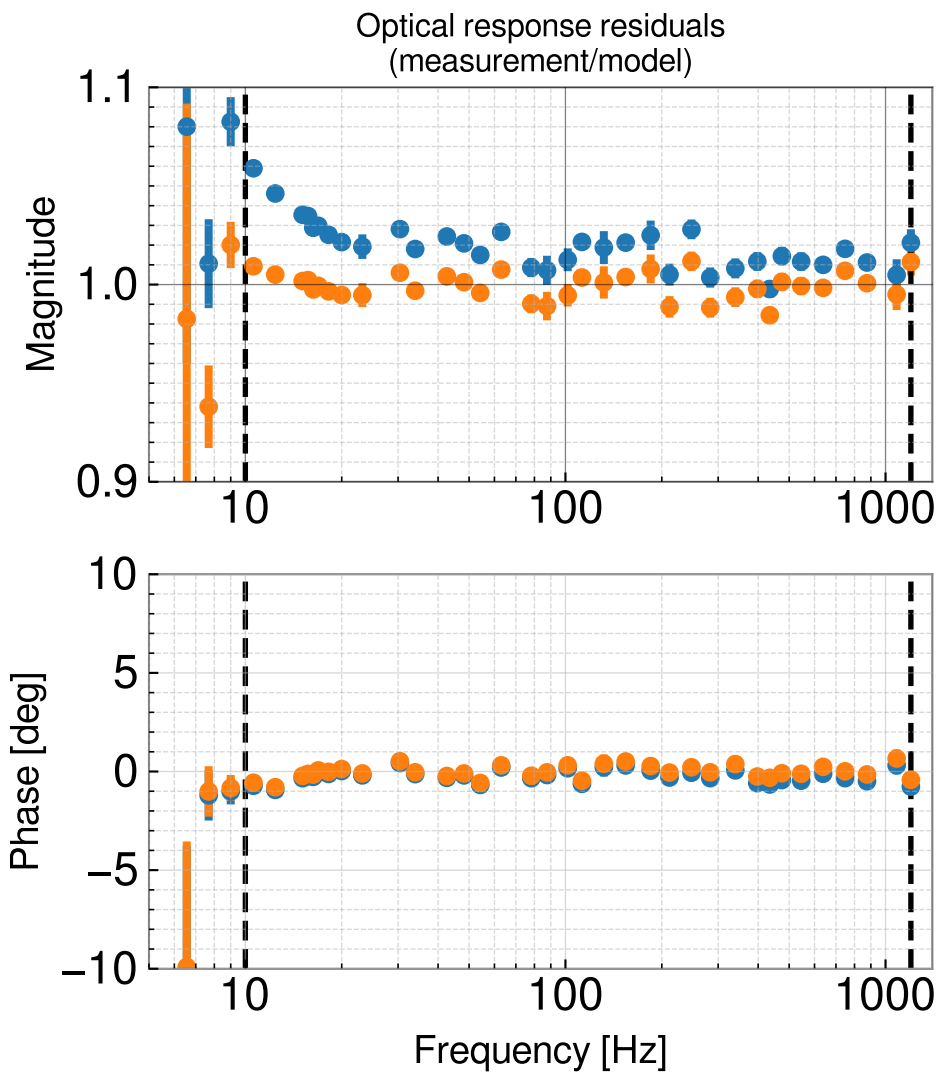
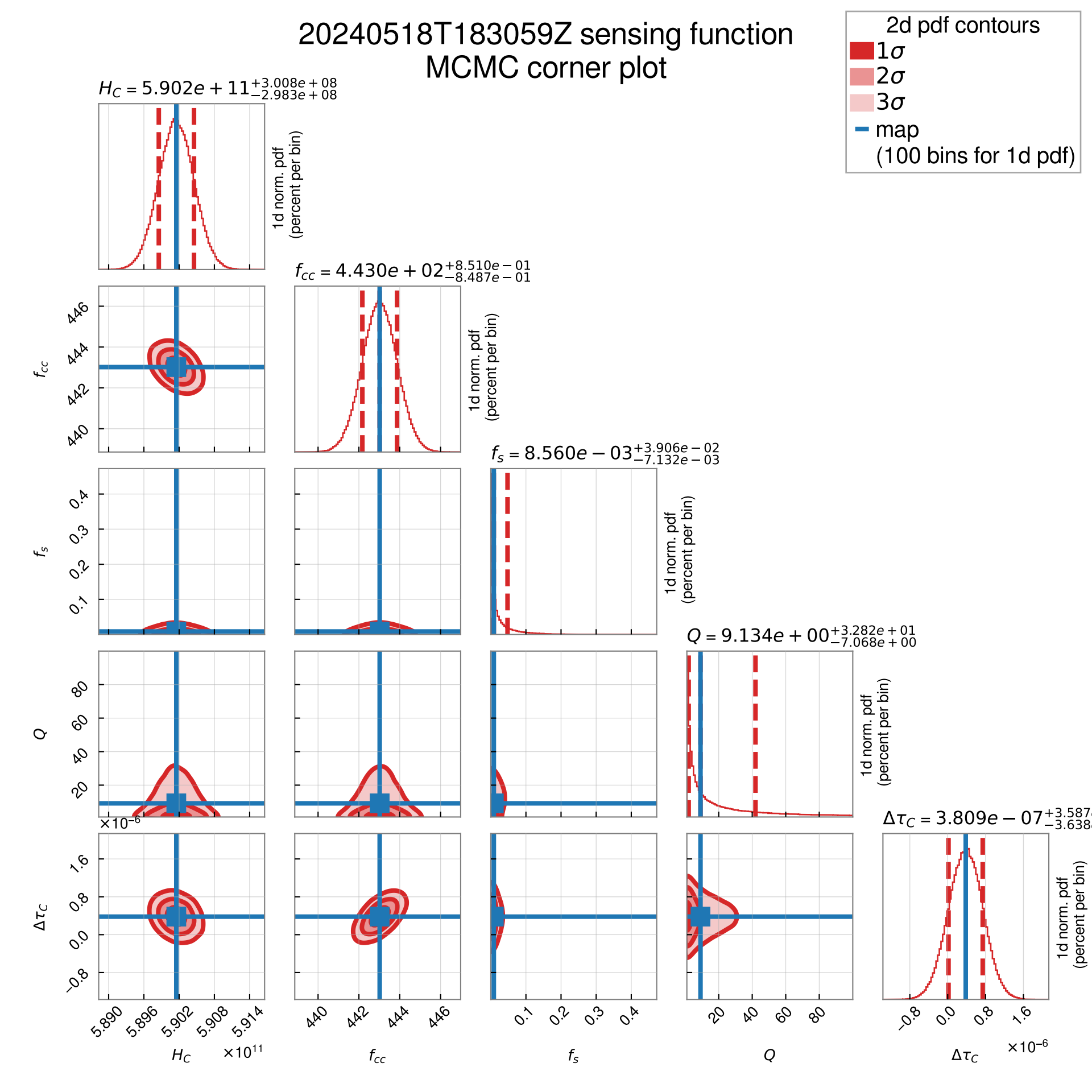
L1 sensing model MCMC summary

All fixed parameters drawn from /ligo/groups/cal/L1/reports/20240518T183037Z/pydarm_L1.ini



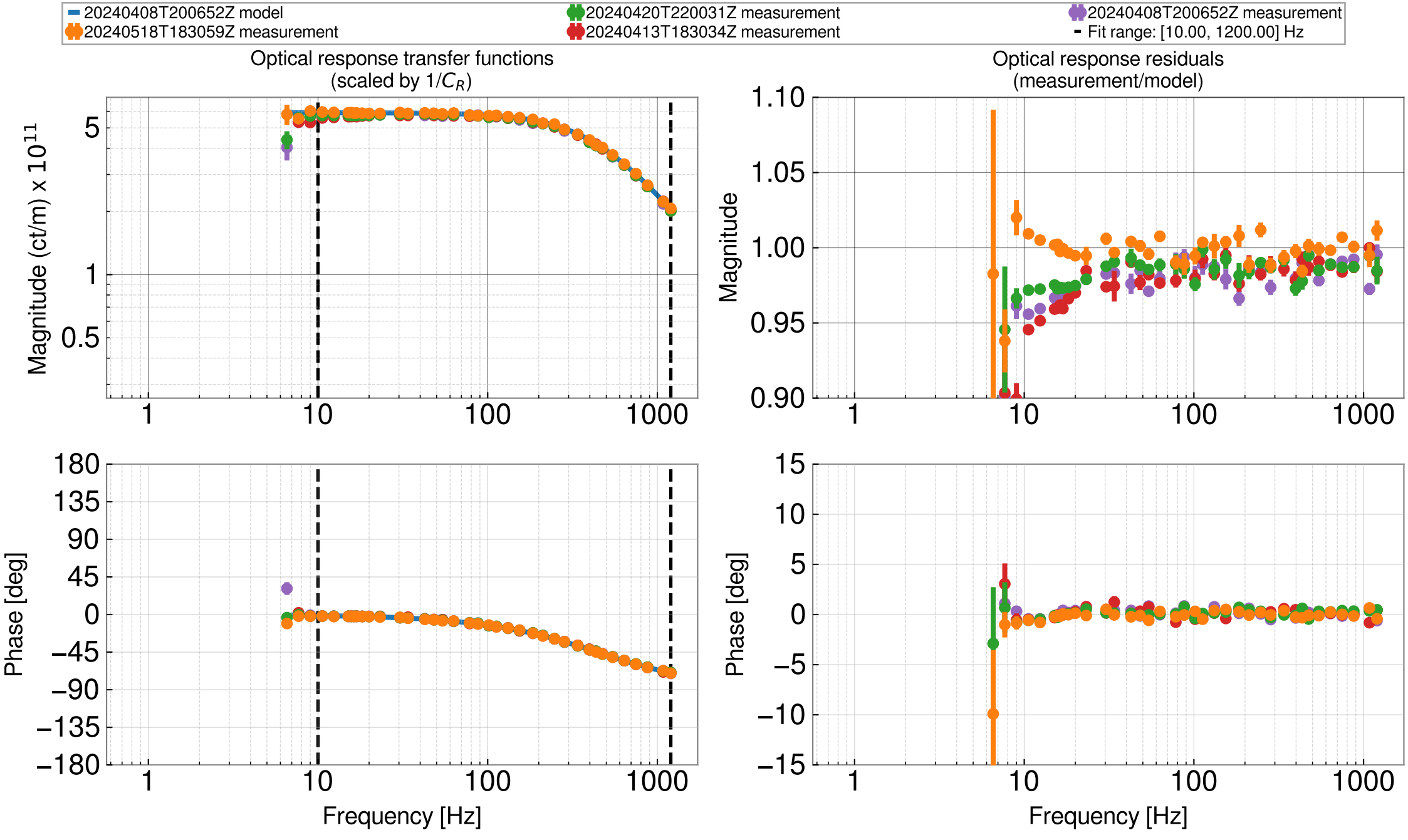


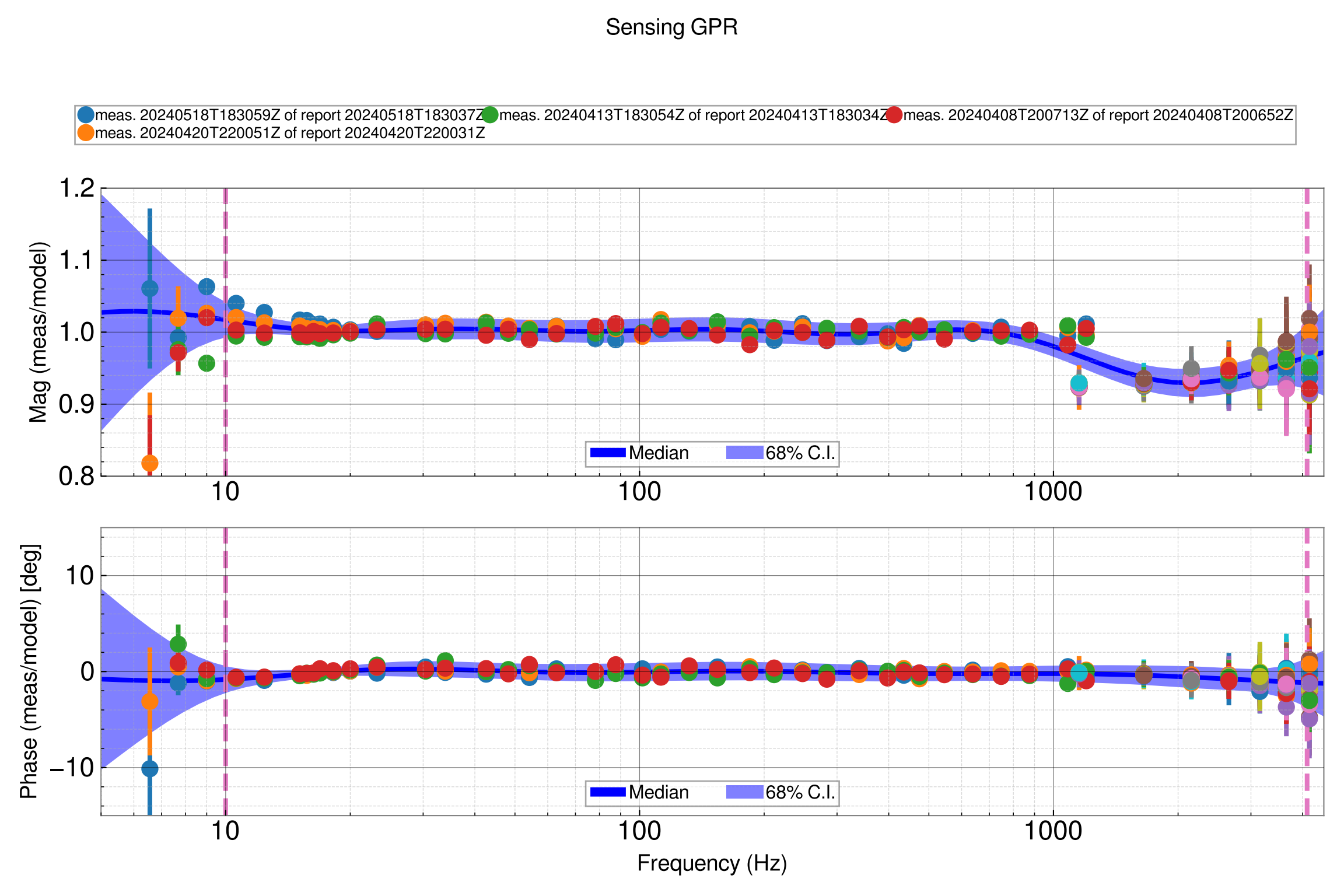
Parameter	(value +/-)	value	+	-
Optical gain, H_c (ct/m)	5.902e+11	3.008e+08 (0.05%)	2.983e+08 (0.05%)
Cavity_pole, f_cc (Hz)	443	0.851 (0.19%)	0.8487 (0.19%)
Detuned SRC spring frequency, f_s (Hz)	0.00856	0.03906 (456.29%)	0.007132 (83.32%)
Detuned SRC spring quality factor, Q_s	9.134	32.82 (359.36%)	7.068 (77.38%)
Residual time delay, tau_c (s)	3.809e-07	3.587e-07 (94.18%)	3.638e-07 (95.52%)


20240518T183059Z sensing function
MCMC corner plot
2d pdf contours
1σ
2σ
3σ
map
(100 bins for 1d pdf)
$H_C = 5.902e+11^{+3.008e+08}_{-2.983e+08}$
$f_{cc} = 4.430e+02^{+8.510e-01}_{-8.487e-01}$
$f_s = 8.560e-03^{+3.906e-02}_{-7.132e-03}$
$Q = 9.134e+00^{+3.282e+01}_{-7.068e+00}$
$\Delta\tau_C = 3.809e-07^{+3.587}_{-3.638}$
1d norm. pdf
(percent per bin)
H_C
$\times 10^{11}$
f_{cc}
f_s
Q
$\Delta\tau_C$
$\times 10^{-6}$

L1 sensing model history

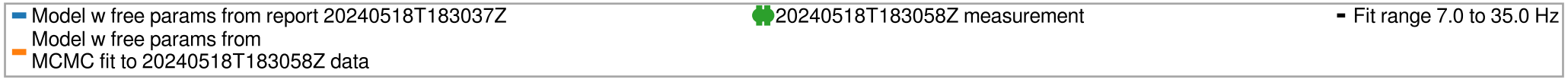
All fixed parameters drawn from /ligo/groups/cal/L1/reports/20240518T183037Z/pydarm_L1.ini

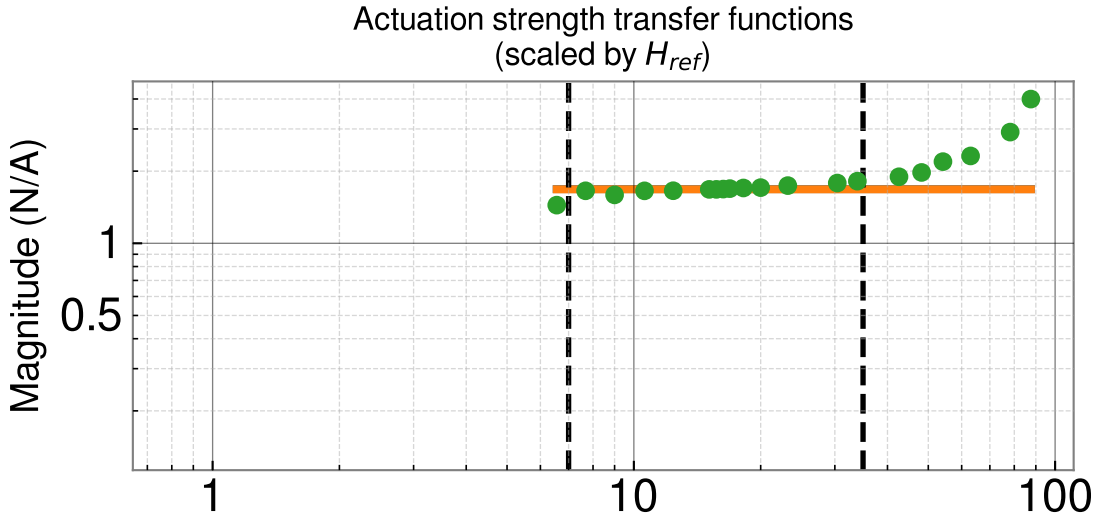


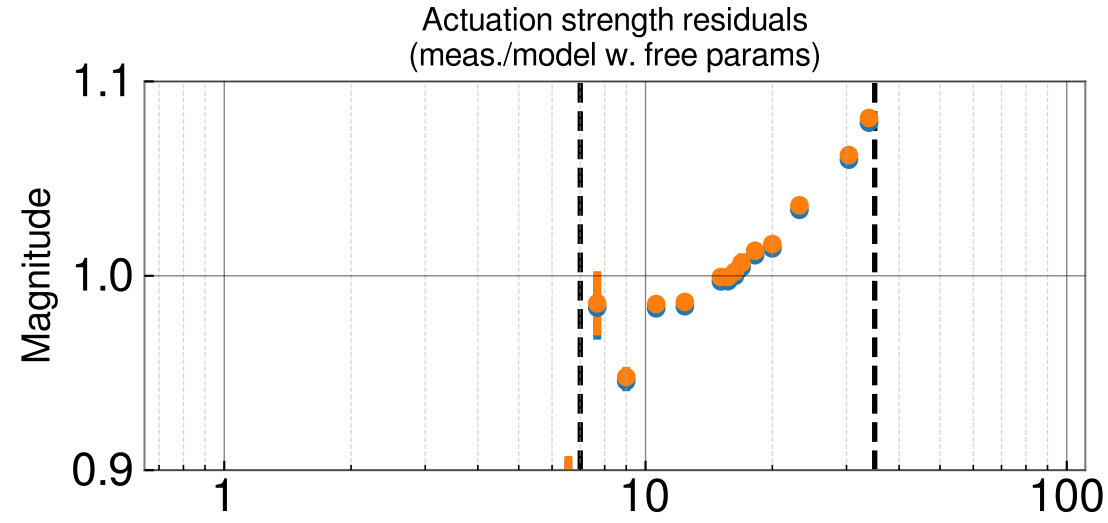

Sensing GPR
meas. 20240518T183059Z of report 20240518T183037Z
meas. 20240413T183054Z of report 20240413T183034Z
meas. 20240408T200713Z of report 20240408T200652Z
meas. 20240420T220051Z of report 20240420T220031Z
Mag (meas/model)
1.2
1.1
1.0
0.9
0.8
Median
68% C.I.
10
100
1000
Phase (meas/model) [deg]
10
0
−10
Median
68% C.I.
10
100
1000
Frequency (Hz)

L1SUSEX L1 actuation model MCMC summary

All fixed parameters drawn from /ligo/groups/cal/L1/reports/20240518T183037Z/pydarm_L1.ini

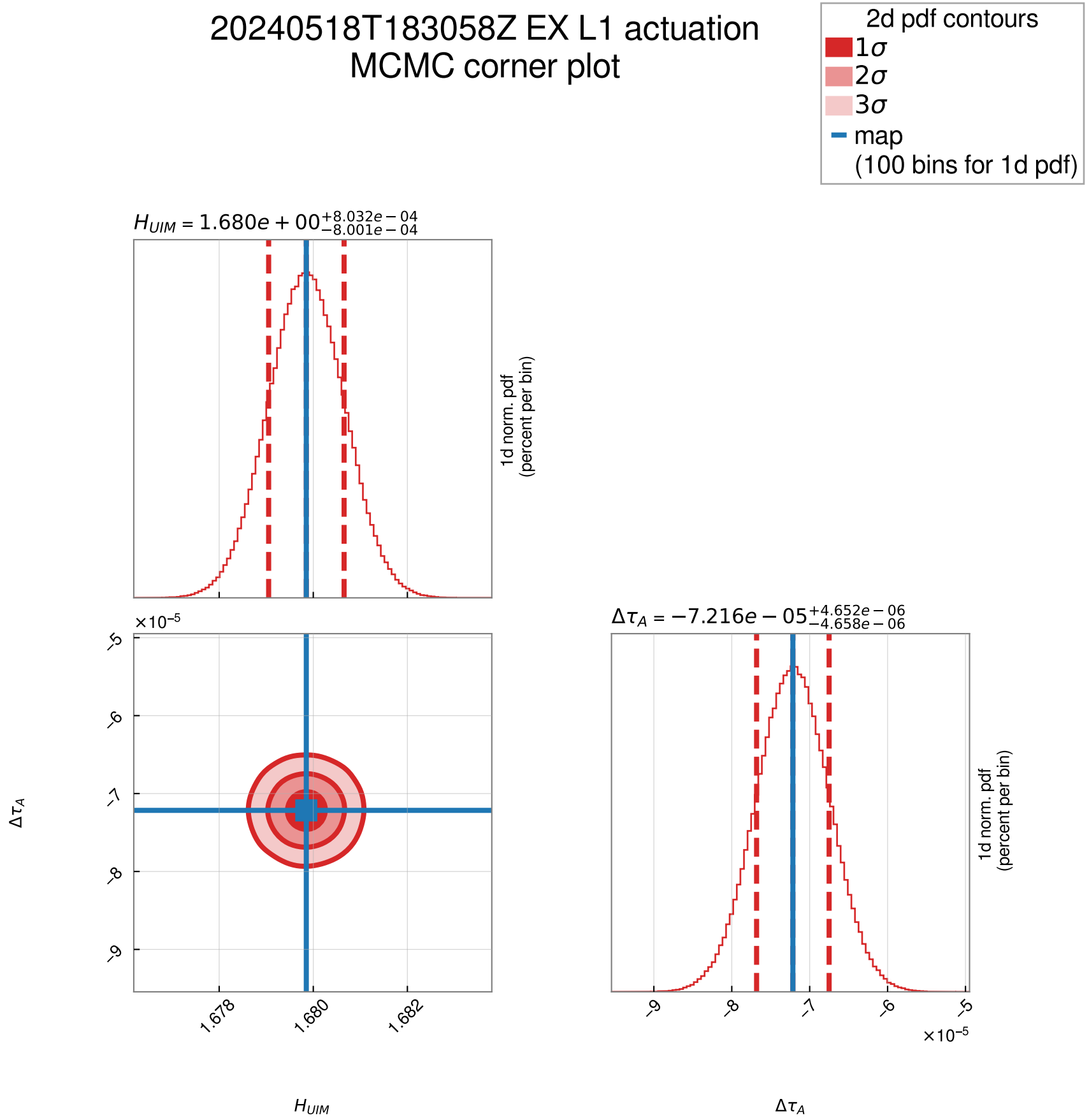


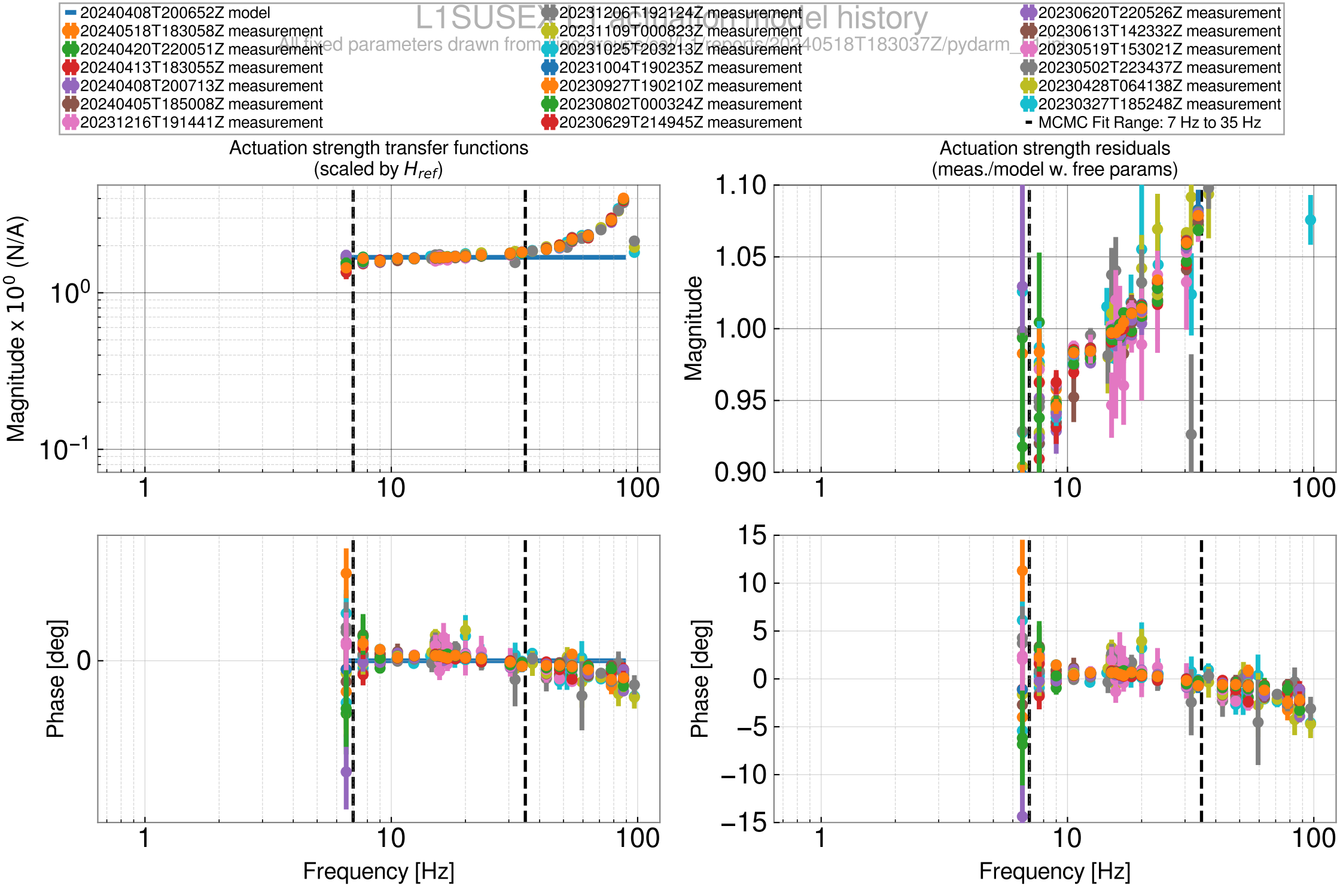




Parameter (value +/-)	value	+	-
Actuation Gain, Hau (N/A)	1.68	0.0008032 (0.05%)	0.0008001 (0.05%)
Residual time delay, tau_A (s)	-7.216e-05	4.652e-06 (-6.45%)	4.658e-06 (-6.46%)

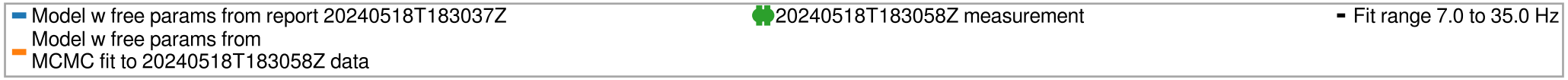
20240518T183058Z EX L1 actuation
MCMC corner plot

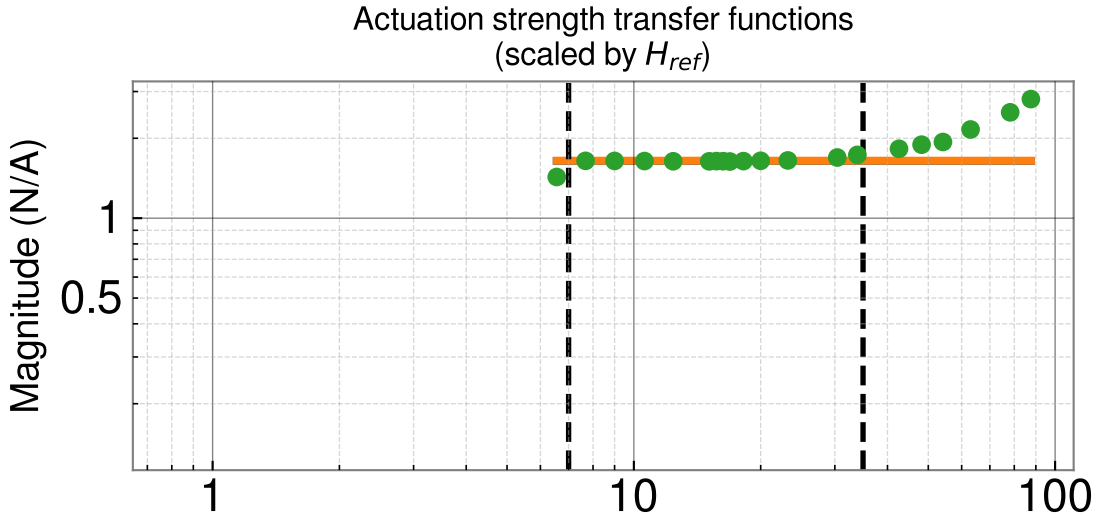


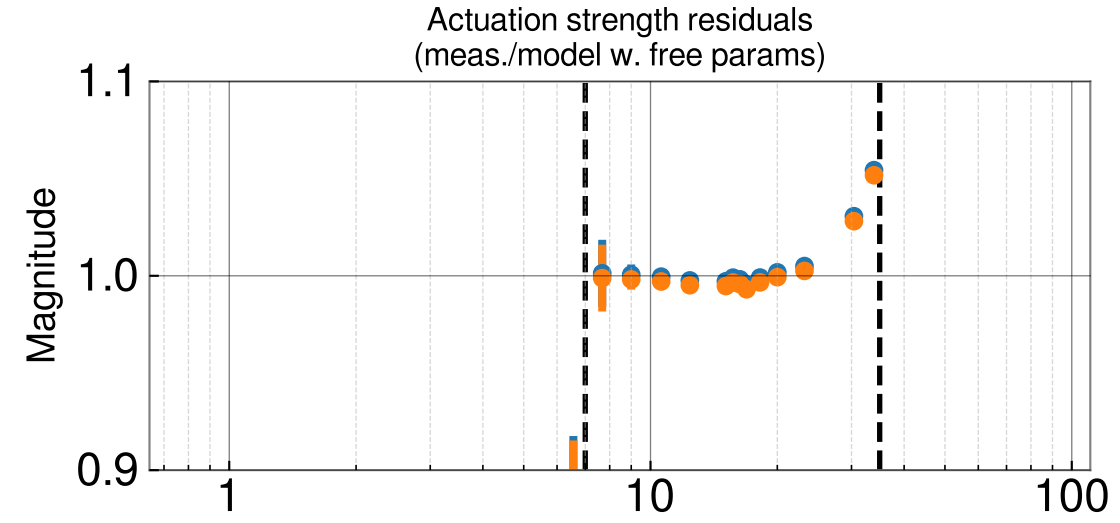

L1SUSEX L1 actuation model history
All fixed parameters drawn from /ligo/groups/cal/L1/reports/20240518T183037Z/pydarm_H1.ini
20240408T200652Z model
20240518T183058Z measurement
20240420T220051Z measurement
20240413T183055Z measurement
20240408T200713Z measurement
20240405T185008Z measurement
20231216T191441Z measurement
20231206T192124Z measurement
20231109T000823Z measurement
20231025T203213Z measurement
20231004T190235Z measurement
20230927T190210Z measurement
20230802T000324Z measurement
20230629T214945Z measurement
20230620T220526Z measurement
20230613T142332Z measurement
20230519T153021Z measurement
20230502T223437Z measurement
20230428T064138Z measurement
20230327T185248Z measurement
MCMC Fit Range: 7 Hz to 35 Hz
Actuation strength transfer functions
(scaled by H_{ref})
Magnitude x 10^0 (N/A)
10^0
10^{-1}
Actuation strength residuals
(meas./model w. free params)
Magnitude
1.10
1.05
1.00
0.95
0.90
Phase [deg]
0
15
10
5
0
−5
−10
−15
1
10
100
Frequency [Hz]

L1SUSEY L1 actuation model MCMC summary

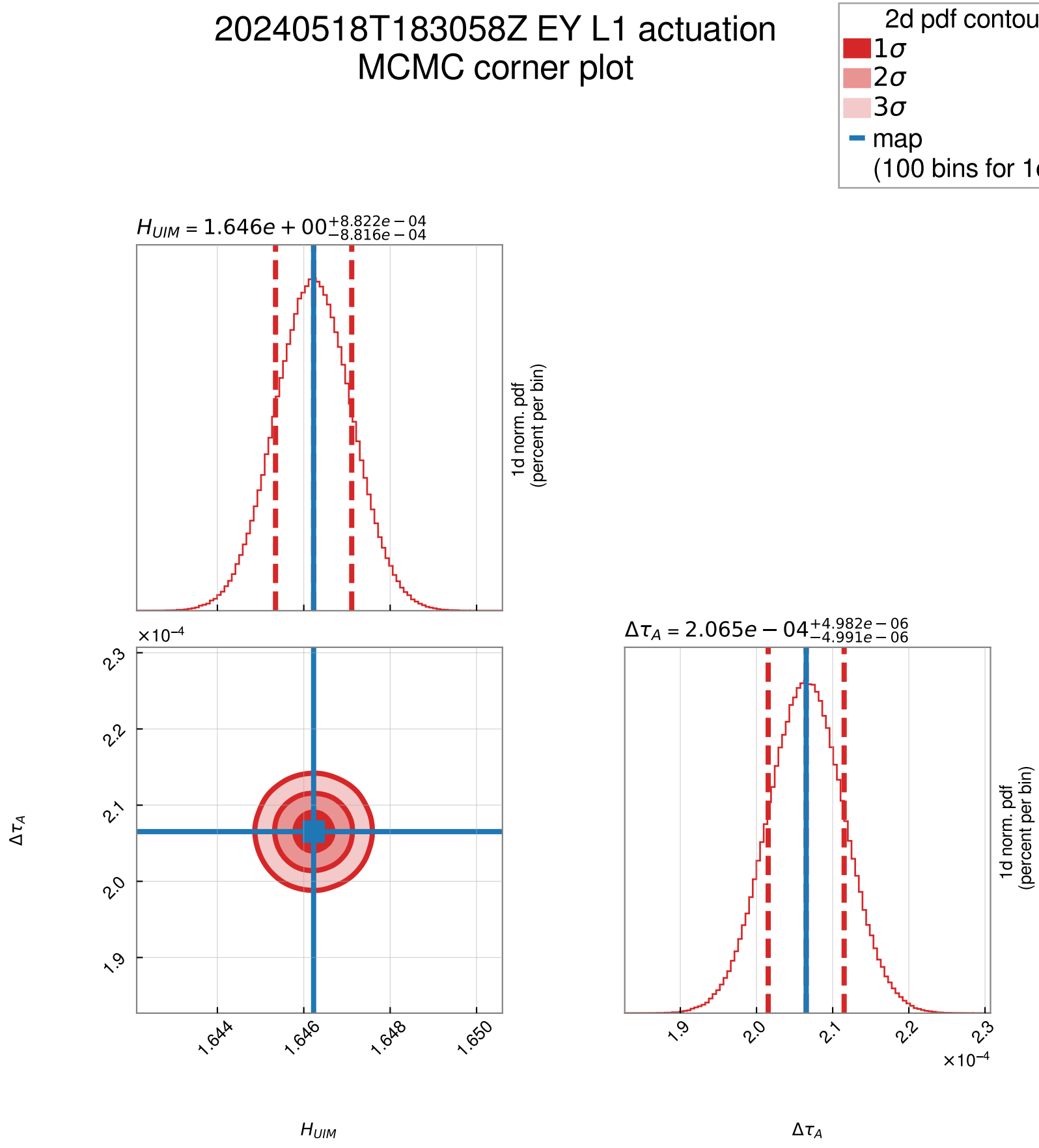
All fixed parameters drawn from /ligo/groups/cal/L1/reports/20240518T183037Z/pydarm_L1.ini

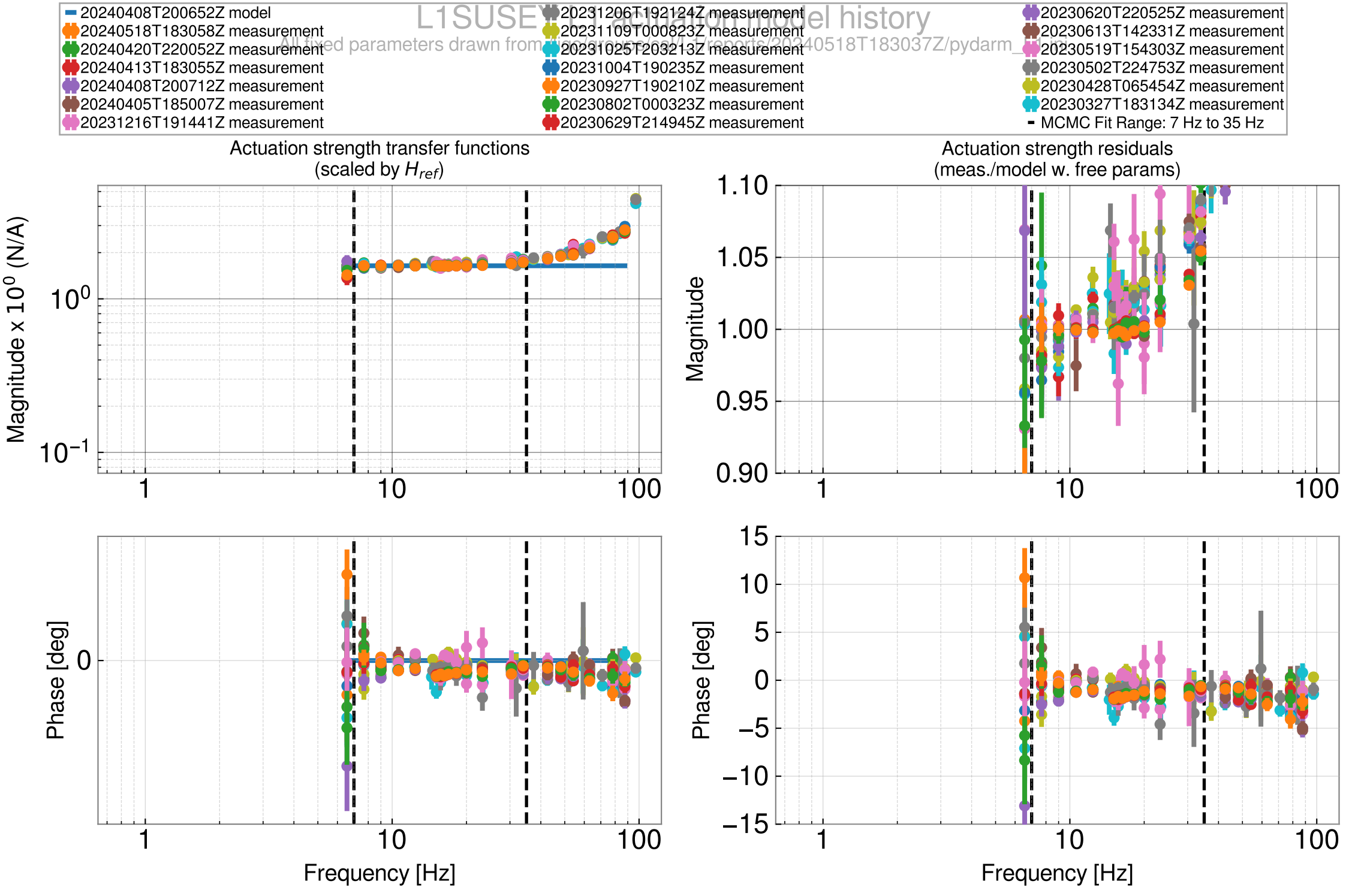






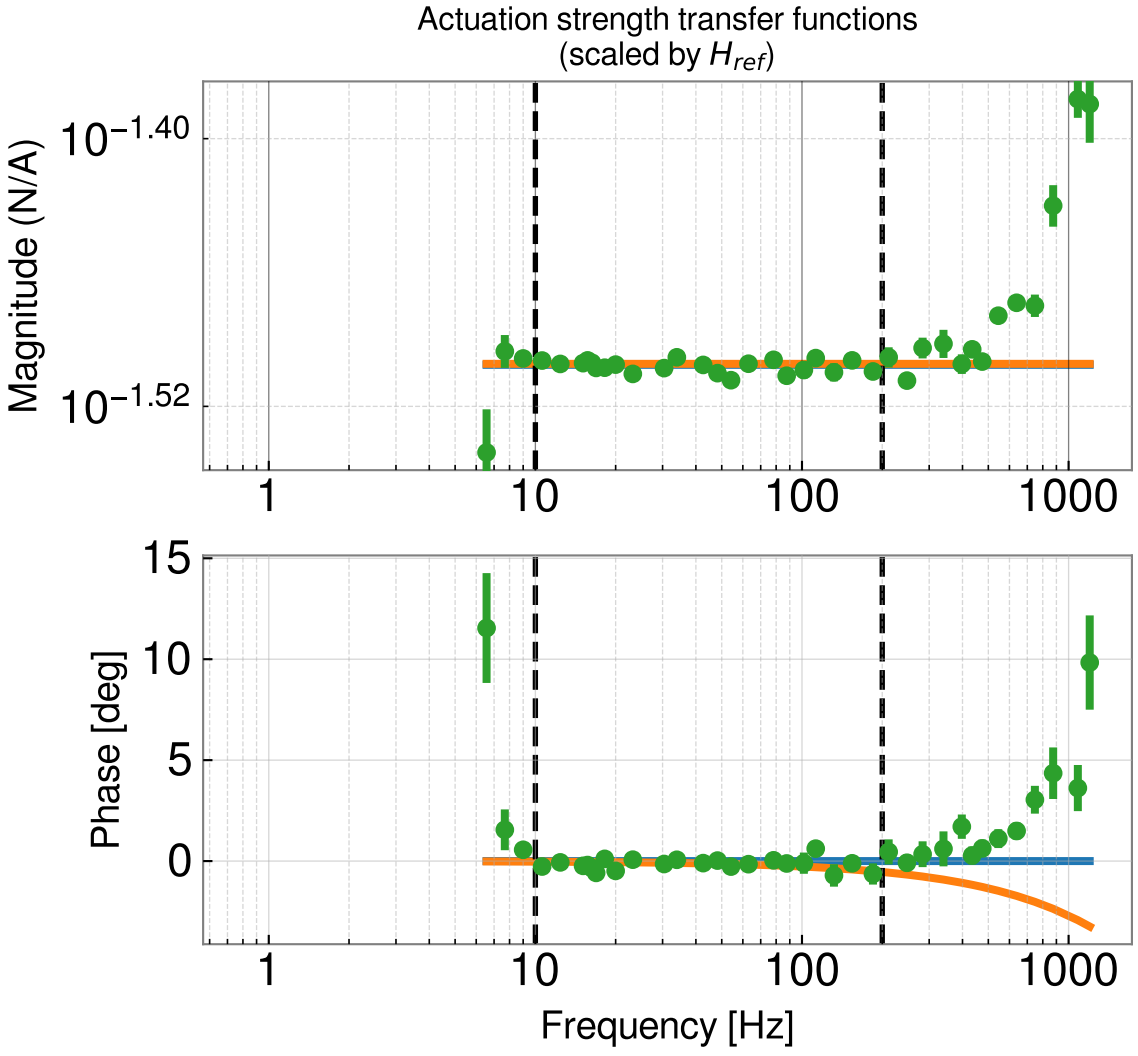
Parameter (value +/-)	value	+	-
Actuation Gain, Hau (N/A)	1.646	0.0008822 (0.05%)	0.0008816 (0.05%)
Residual time delay, tau_A (s)	0.0002065	4.982e-06 (2.41%)	4.991e-06 (2.42%)

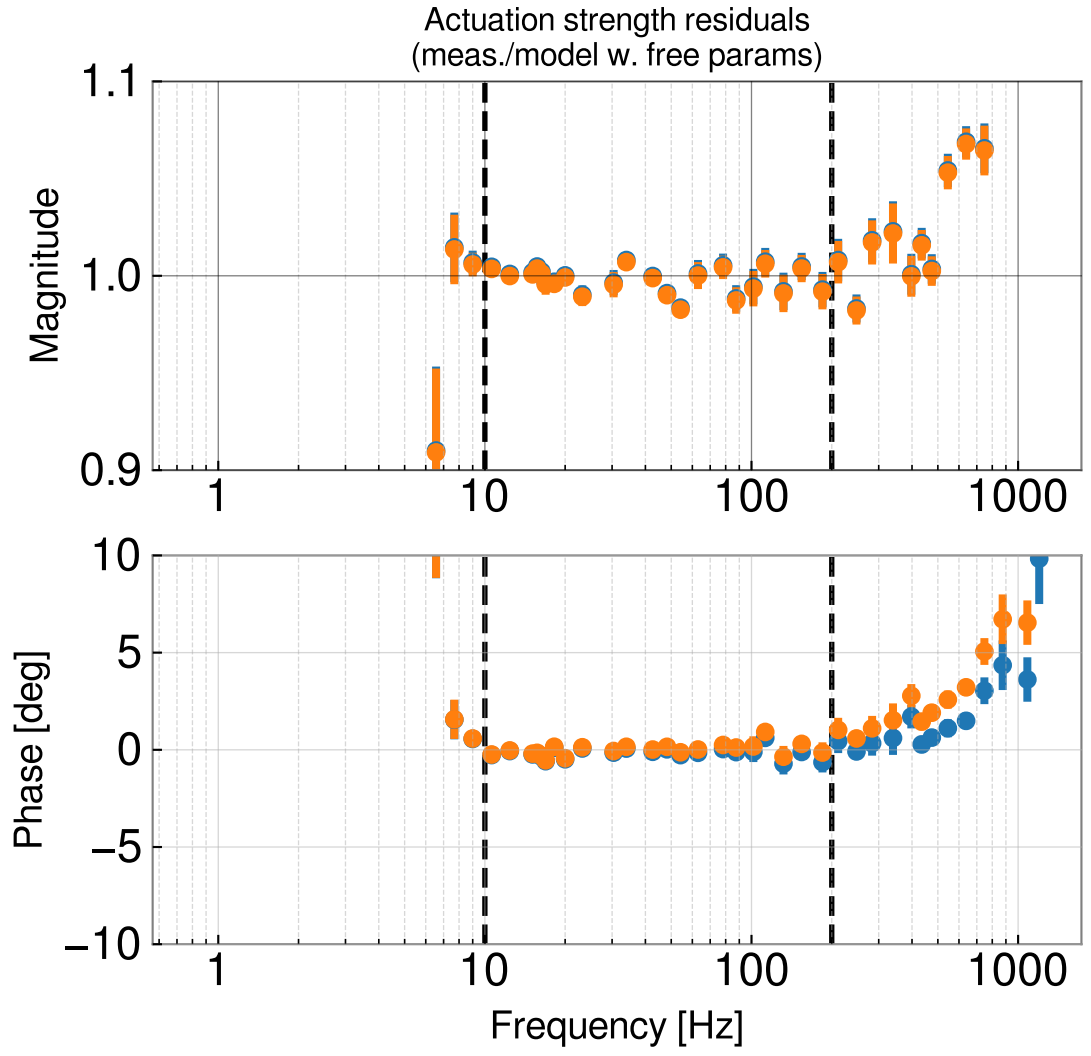

20240518T183058Z EY L1 actuation
MCMC corner plot
2d pdf contours
1σ
2σ
3σ
map
(100 bins for 1d pdf)
$H_{UIM} = 1.646e+00^{+8.822e-04}_{-8.816e-04}$
1d norm. pdf
(percent per bin)
×10⁻⁴
2.3
2.2
2.1
2.0
1.9
$\Delta\tau_A$
1.644
1.646
1.648
1.650
H_{UIM}
$\Delta\tau_A = 2.065e-04^{+4.982e-06}_{-4.991e-06}$
1d norm. pdf
(percent per bin)
1.9
2.0
2.1
2.2
2.3
×10⁻⁴
$\Delta\tau_A$


L1SUSEX L1 actuation model history
All fixed parameters drawn from /ligo/groups/cal/L1/reports/20240518T183037Z/pydarm_L1.ini
20240408T200652Z model
20240518T183058Z measurement
20240420T220052Z measurement
20240413T183055Z measurement
20240408T200712Z measurement
20240405T185007Z measurement
20231216T191441Z measurement
20231206T192124Z measurement
20231109T000823Z measurement
20231025T203213Z measurement
20231004T190235Z measurement
20230927T190210Z measurement
20230802T000323Z measurement
20230629T214945Z measurement
20230620T220525Z measurement
20230613T142331Z measurement
20230519T154303Z measurement
20230502T224753Z measurement
20230428T065454Z measurement
20230327T183134Z measurement
MCMC Fit Range: 7 Hz to 35 Hz
Actuation strength transfer functions
(scaled by H_{ref})
Magnitude x 10^0 (N/A)
10^0
10^{-1}
Actuation strength residuals
(meas./model w. free params)
Magnitude
1.10
1.05
1.00
0.95
0.90
Phase [deg]
0
15
10
5
0
−5
−10
−15
1
10
100
Frequency [Hz]

L1SUSEX L2 actuation model MCMC summary

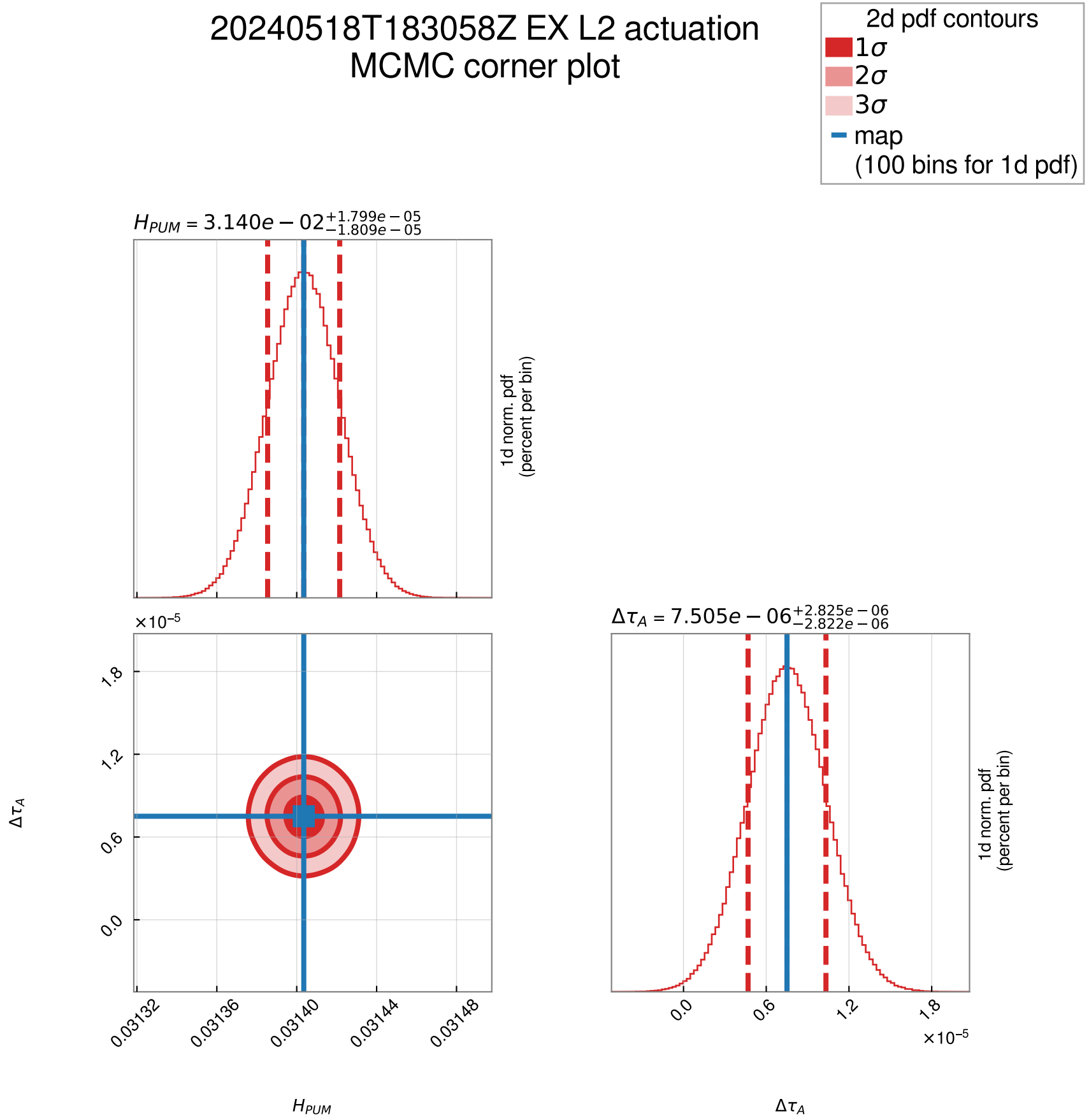
All fixed parameters drawn from /ligo/groups/cal/L1/reports/20240518T183037Z/pydarm_L1.ini

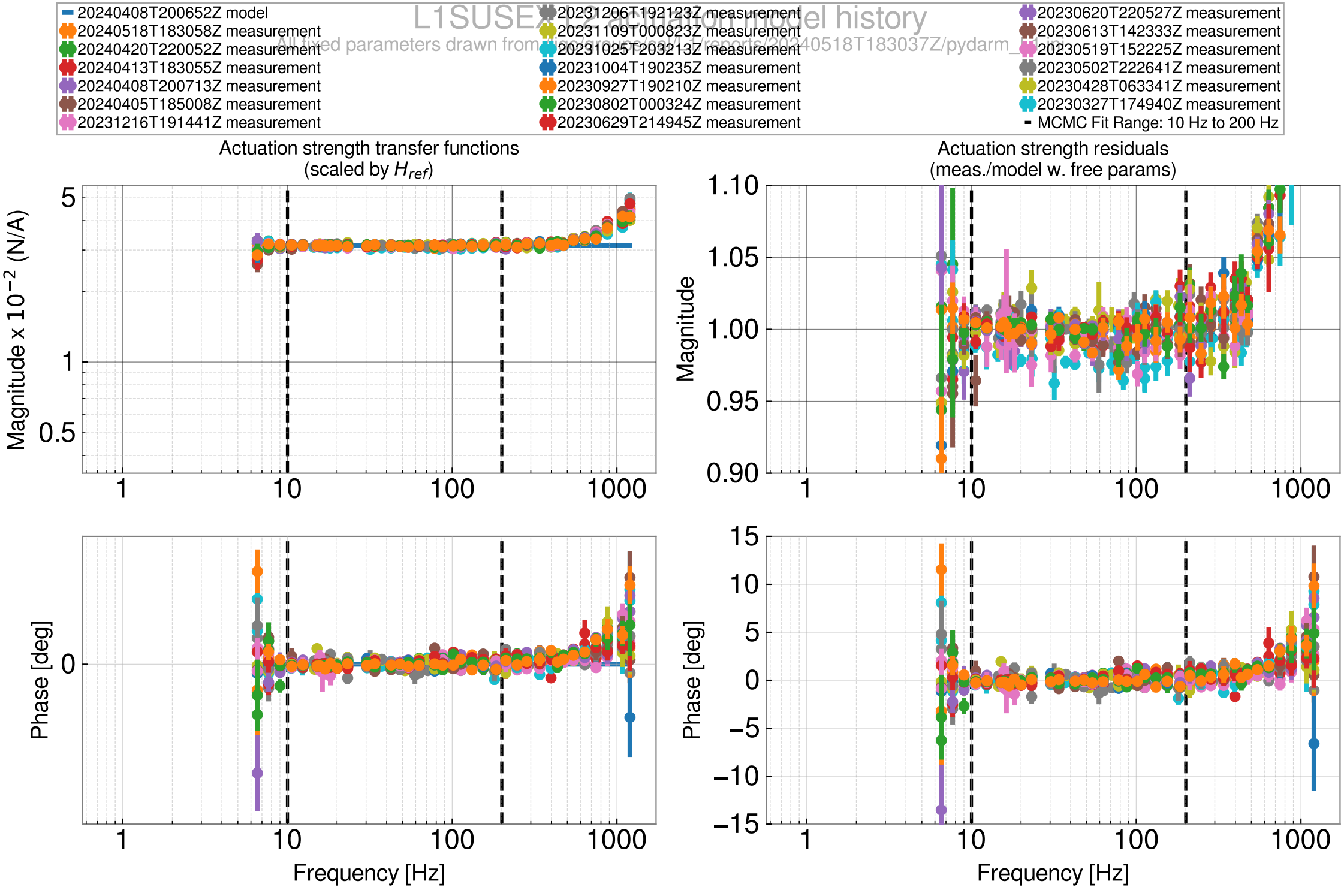




Parameter (value +/-)	value	+	-
Actuation Gain, Hap (N/A)	0.0314	1.799e-05 (0.06%)	1.809e-05 (0.06%)
Residual time delay, tau_A (s)	7.505e-06	2.825e-06 (37.64%)	2.822e-06 (37.60%)

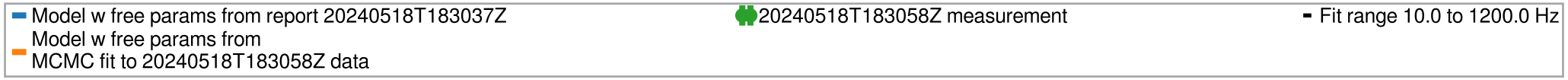
20240518T183058Z EX L2 actuation
MCMC corner plot

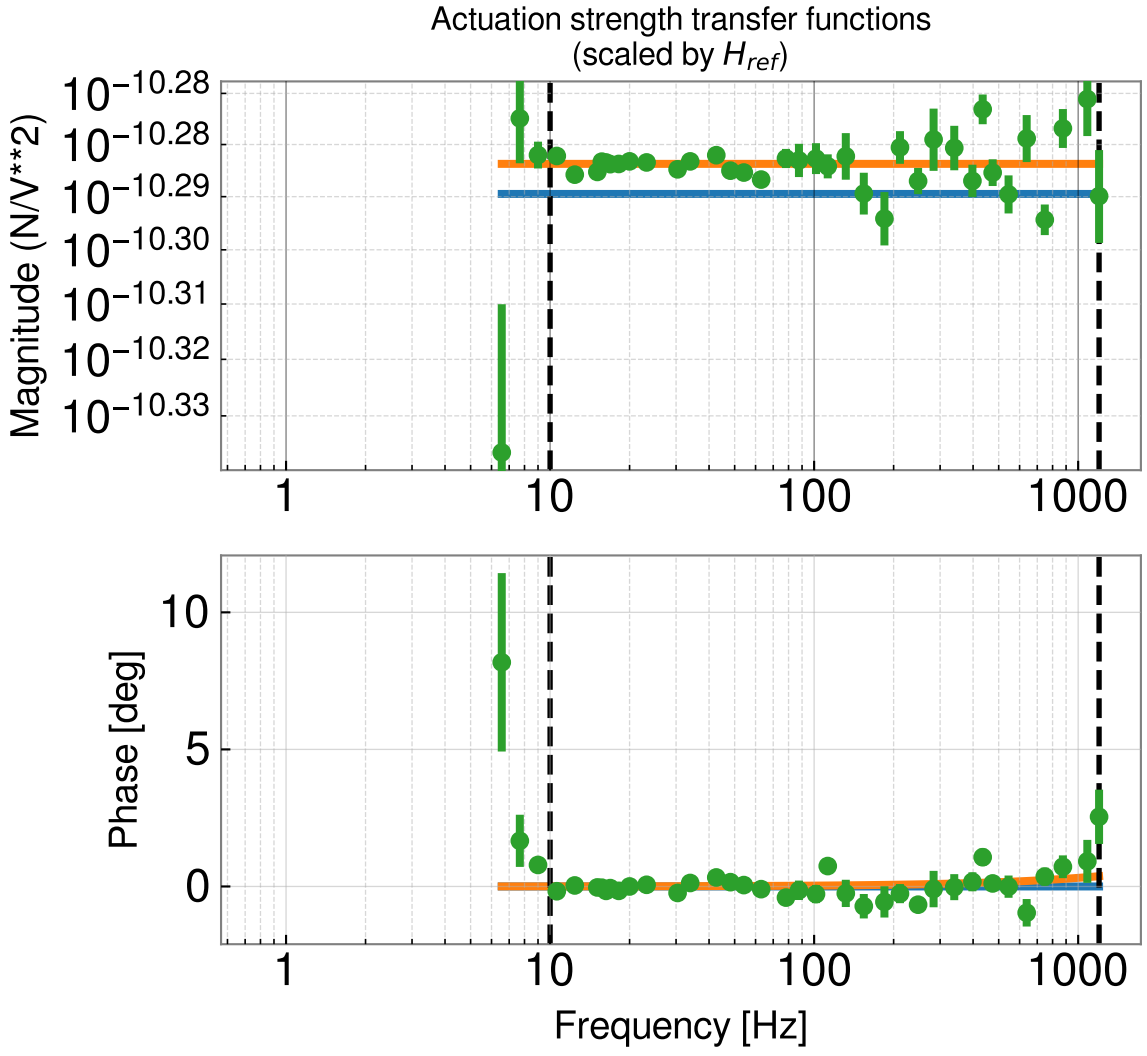


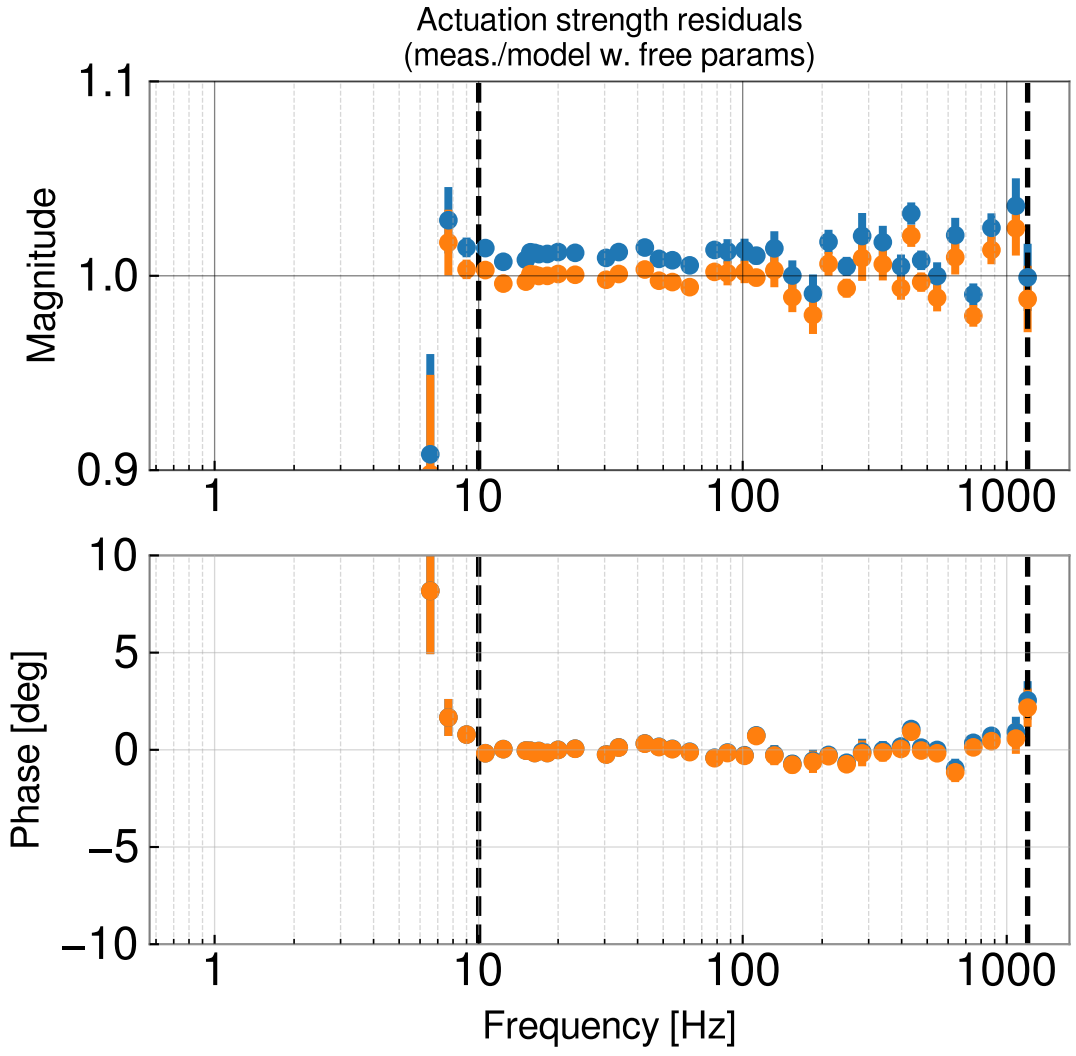

L1SUSEX L2 actuation model history
All fixed parameters drawn from /ligo/groups/cal/L1/reports/20240518T183037Z/pydarm_H1.ini
20240408T200652Z model
20240518T183058Z measurement
20240420T220052Z measurement
20240413T183055Z measurement
20240408T200713Z measurement
20240405T185008Z measurement
20231216T191441Z measurement
20231206T192123Z measurement
20231109T000823Z measurement
20231025T203213Z measurement
20231004T190235Z measurement
20230927T190210Z measurement
20230802T000324Z measurement
20230629T214945Z measurement
20230620T220527Z measurement
20230613T142333Z measurement
20230519T152225Z measurement
20230502T222641Z measurement
20230428T063341Z measurement
20230327T174940Z measurement
MCMC Fit Range: 10 Hz to 200 Hz
Actuation strength transfer functions
(scaled by H_{ref})
Magnitude x 10^{-2} (N/A)
Actuation strength residuals
(meas./model w. free params)
Magnitude
Phase [deg]
Frequency [Hz]

L1SUSEX L3 actuation model MCMC summary

All fixed parameters drawn from /ligo/groups/cal/L1/reports/20240518T183037Z/pydarm_L1.ini

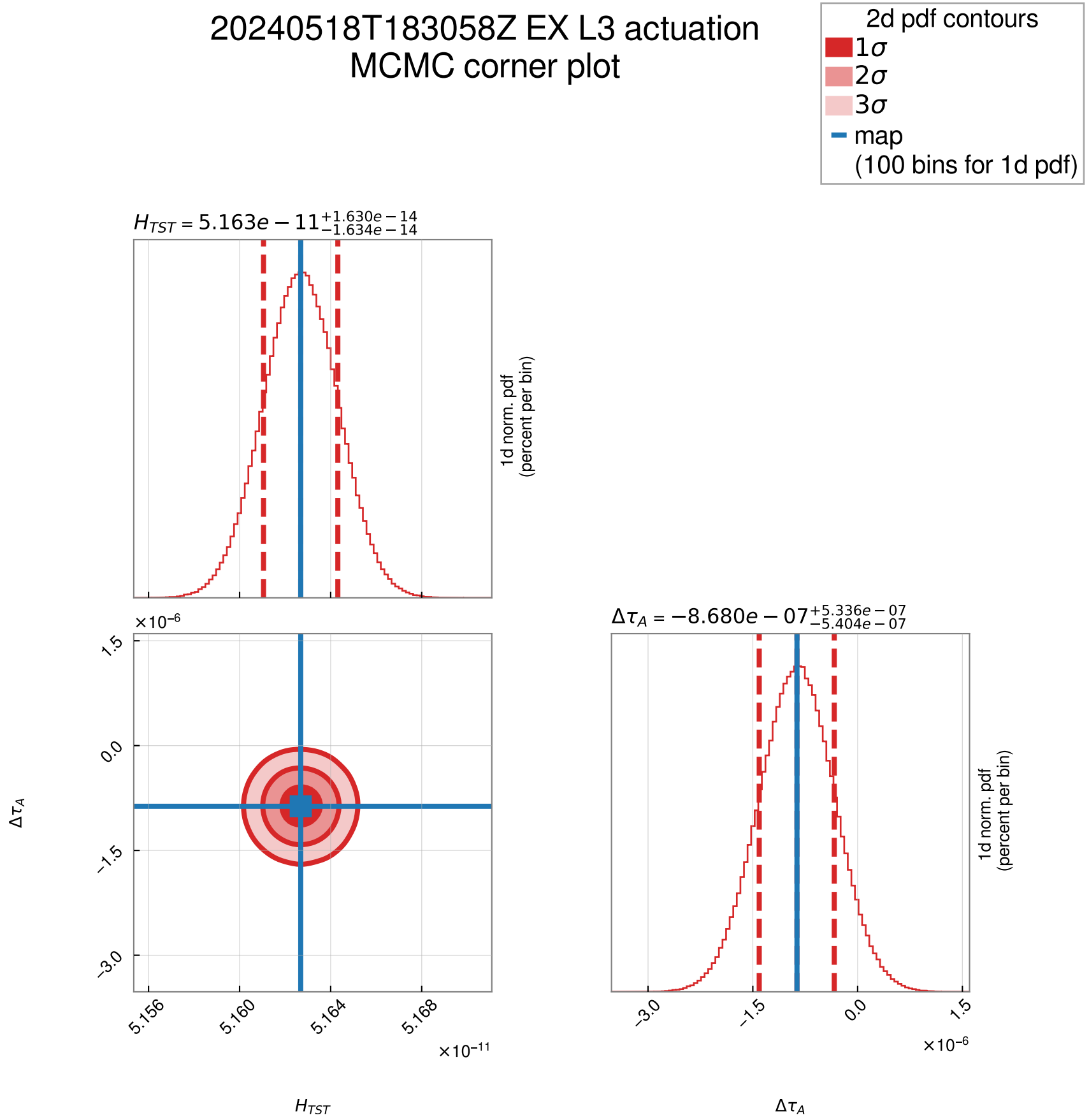


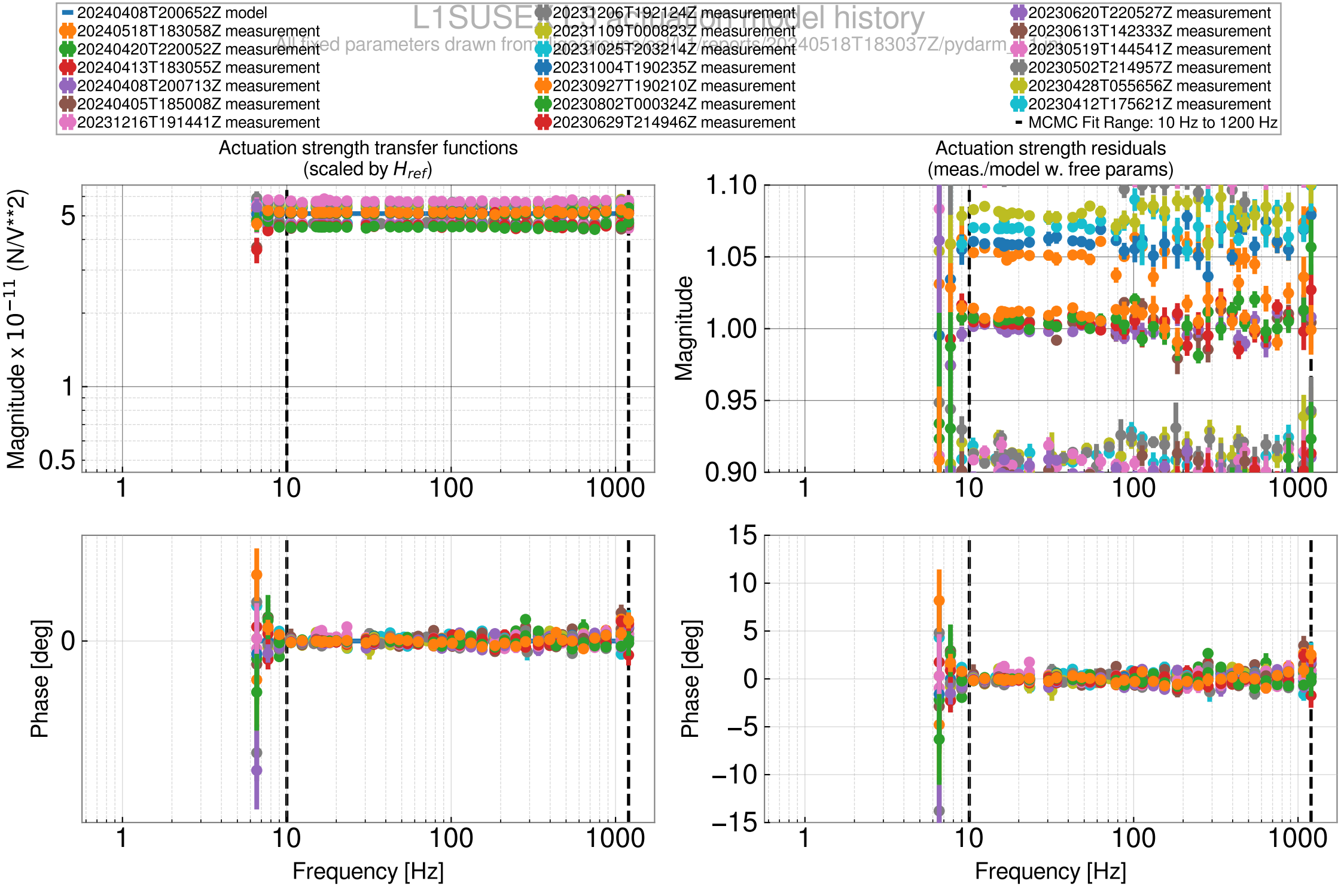


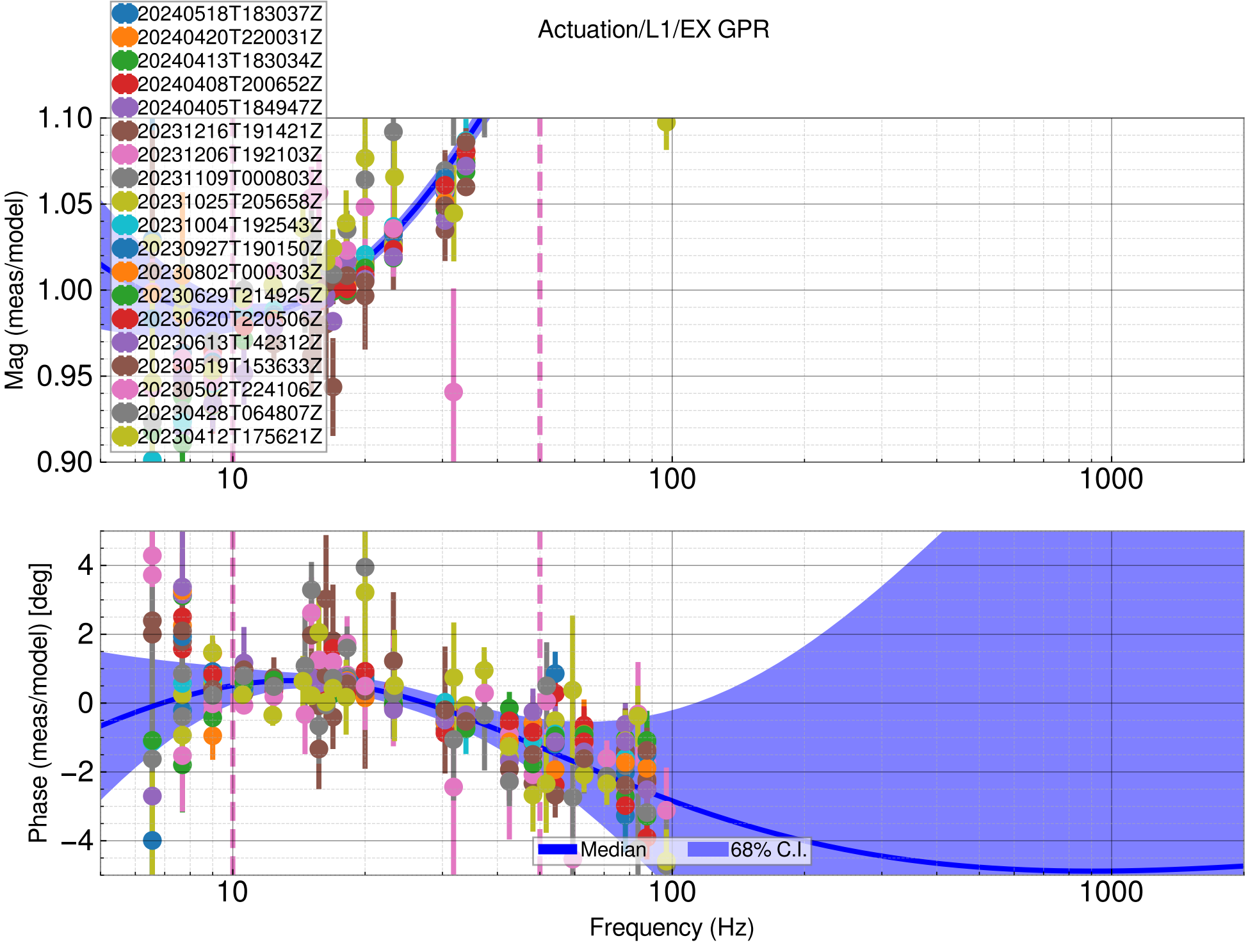


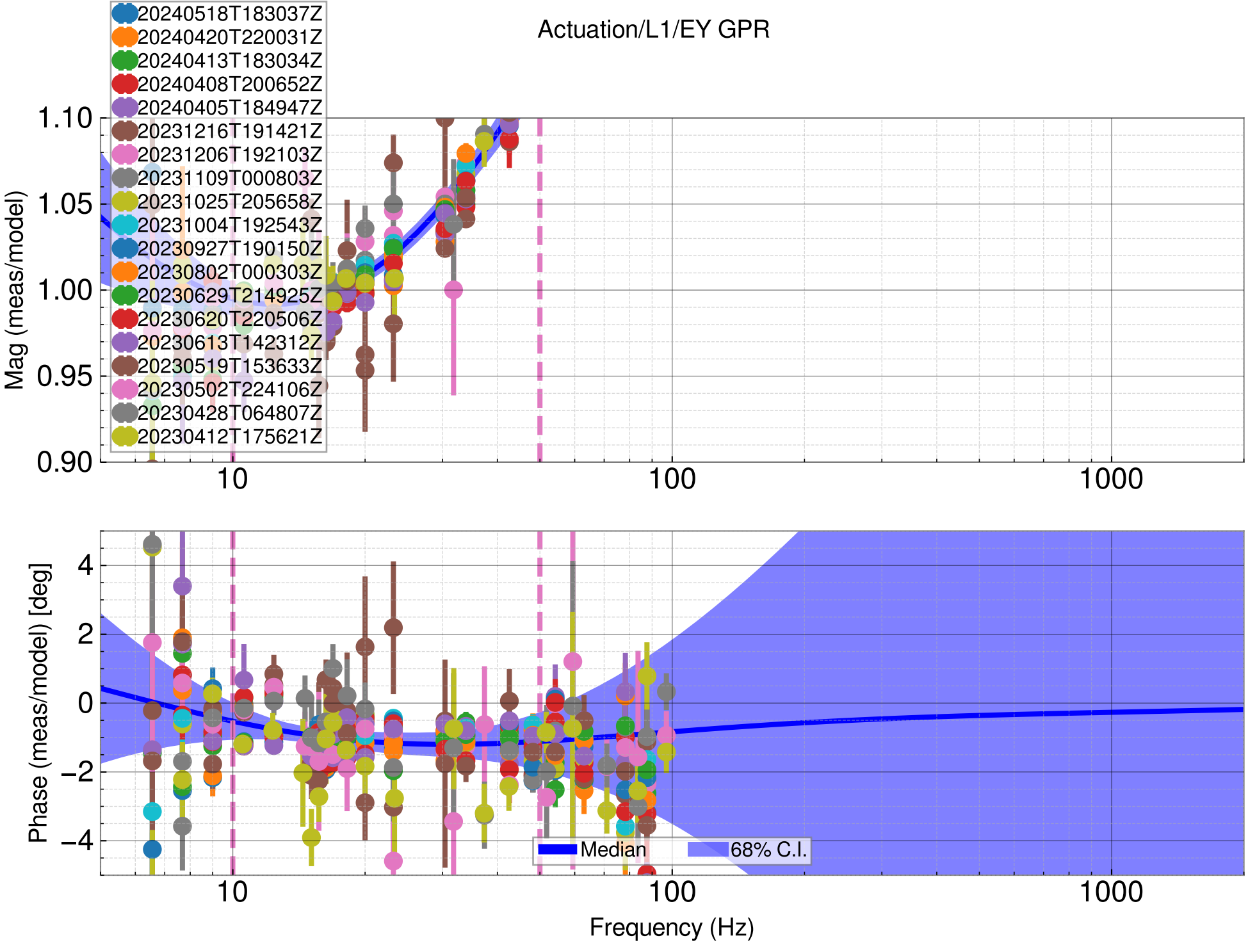
Parameter (value +/-)	value	+	-
Actuation Gain, Hat (N/V**2)	5.163e-11	1.63e-14 (0.03%)	1.634e-14 (0.03%)
Residual time delay, tau_A (s)	-8.68e-07	5.336e-07 (-61.47%)	5.404e-07 (-62.25%)

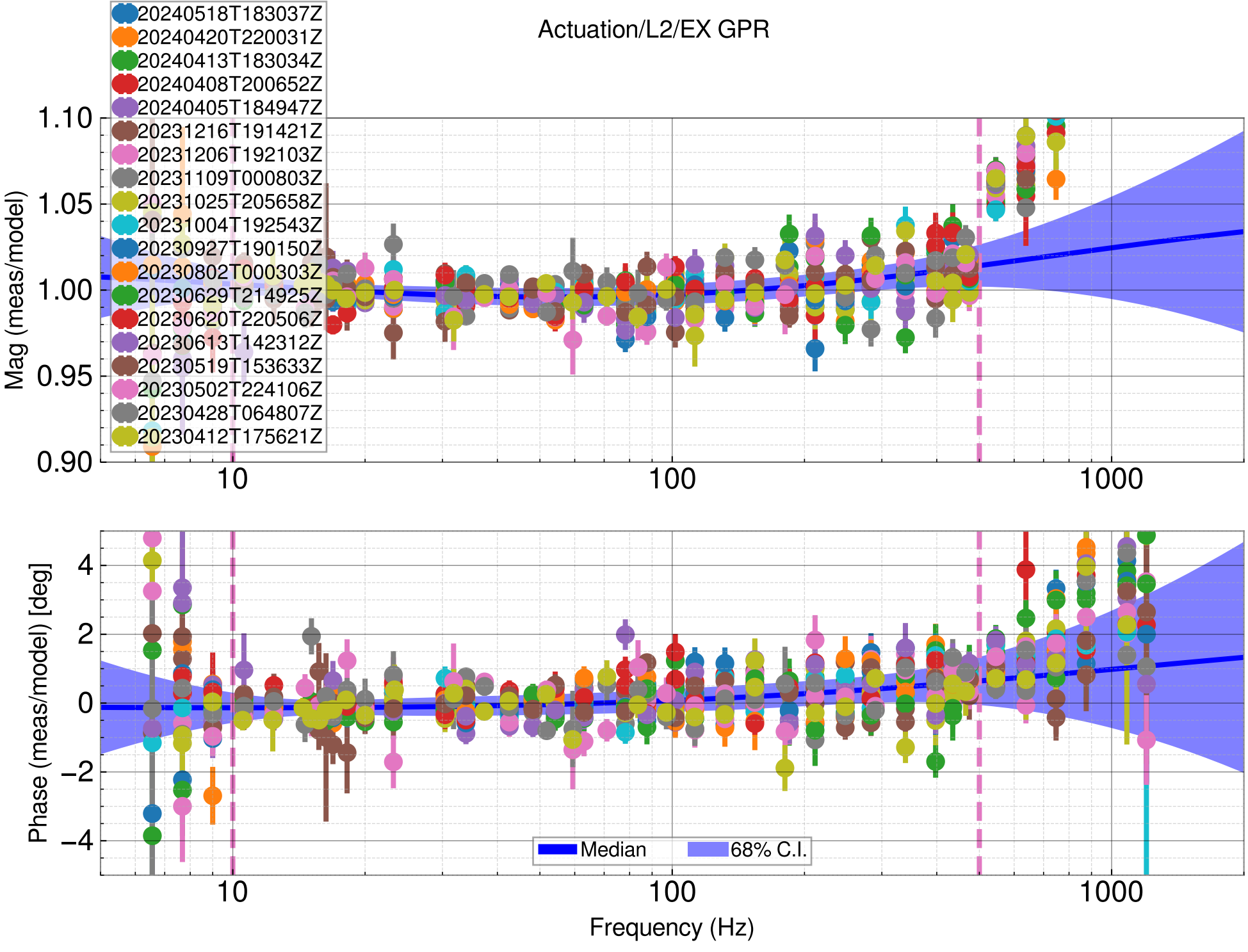
20240518T183058Z EX L3 actuation
MCMC corner plot

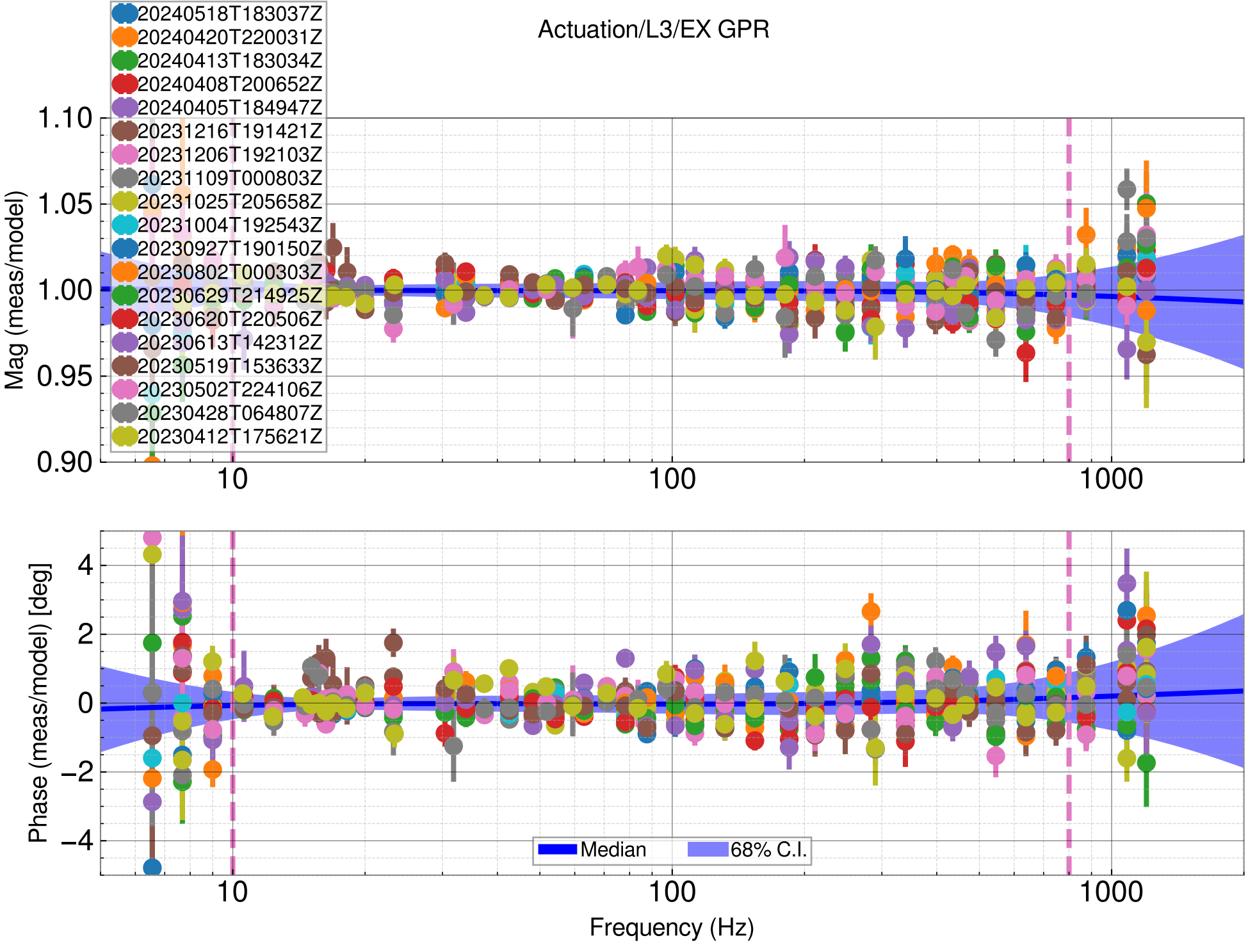


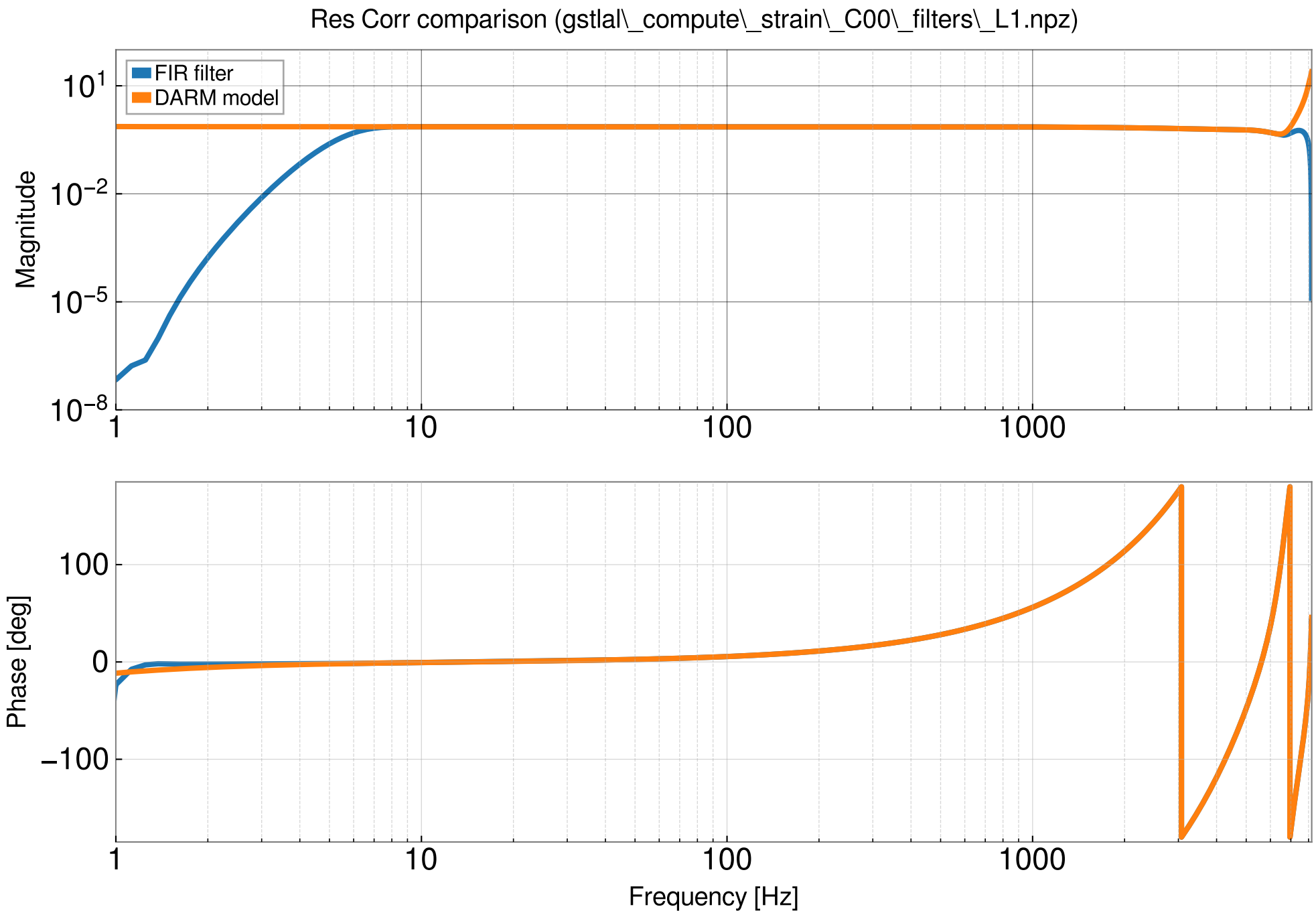

L1SUSETMY L2 actuation model history
All fixed parameters drawn from /ligo/groups/cal/L1/reports/20240518T183037Z/pydarm_L1.ini
20240408T200652Z model
20240518T183058Z measurement
20240420T220052Z measurement
20240413T183055Z measurement
20240408T200713Z measurement
20240405T185008Z measurement
20231216T191441Z measurement
20231206T192124Z measurement
20231109T000823Z measurement
20231025T203214Z measurement
20231004T190235Z measurement
20230927T190210Z measurement
20230802T000324Z measurement
20230629T214946Z measurement
20230620T220527Z measurement
20230613T142333Z measurement
20230519T144541Z measurement
20230502T214957Z measurement
20230428T055656Z measurement
20230412T175621Z measurement
MCMC Fit Range: 10 Hz to 1200 Hz
Actuation strength transfer functions
(scaled by H_{ref})
Magnitude x 10^{-11} (N/V**2)
Actuation strength residuals
(meas./model w. free params)
Magnitude
Phase [deg]
Phase [deg]
Frequency [Hz]
Frequency [Hz]

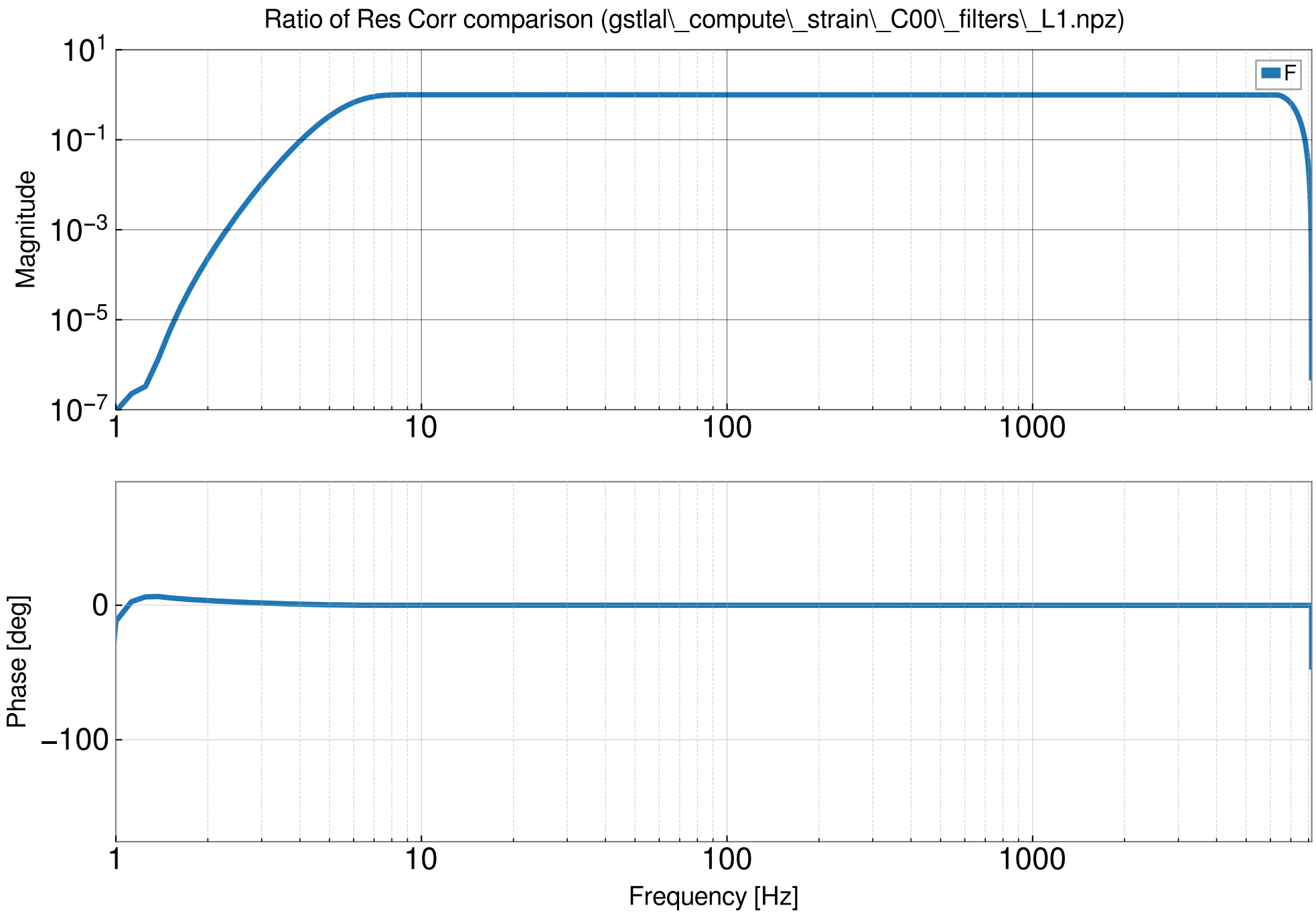

Actuation/L1/EX GPR
20240518T183037Z
20240420T220031Z
20240413T183034Z
20240408T200652Z
20240405T184947Z
20231216T191421Z
20231206T192103Z
20231109T000803Z
20231025T205658Z
20231004T192543Z
20230927T190150Z
20230802T000303Z
20230629T214925Z
20230620T220506Z
20230613T142312Z
20230519T153633Z
20230502T224106Z
20230428T064807Z
20230412T175621Z
Mag (meas/model)
1.10
1.05
1.00
0.95
0.90
10
100
1000
Phase (meas/model) [deg]
4
2
0
−2
−4
Median
68% C.I.
10
100
1000
Frequency (Hz)

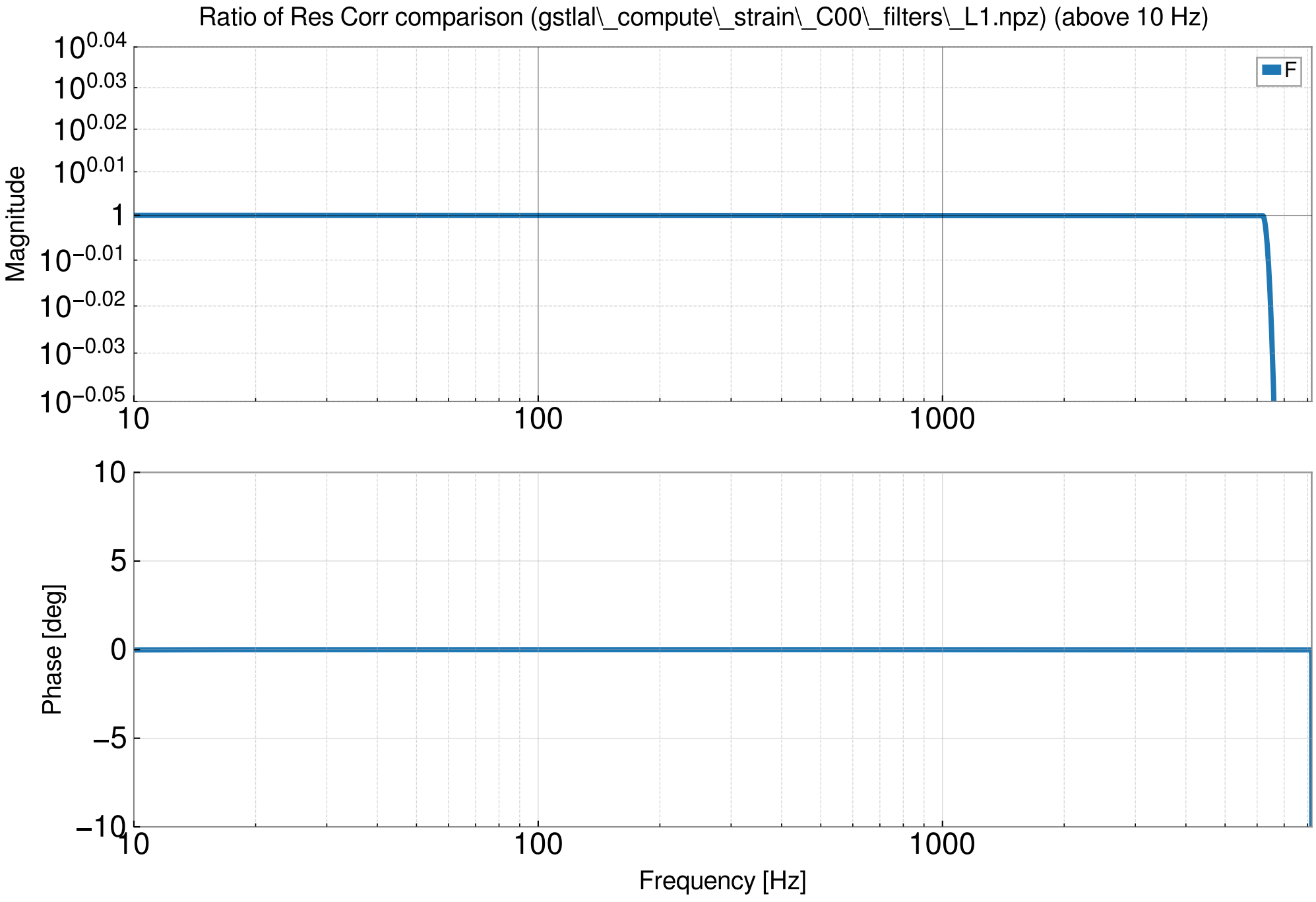

Actuation/L1/EY GPR
20240518T183037Z
20240420T220031Z
20240413T183034Z
20240408T200652Z
20240405T184947Z
20231216T191421Z
20231206T192103Z
20231109T000803Z
20231025T205658Z
20231004T192543Z
20230927T190150Z
20230802T000303Z
20230629T214925Z
20230620T220506Z
20230613T142312Z
20230519T153633Z
20230502T224106Z
20230428T064807Z
20230412T175621Z
Mag (meas/model)
1.10
1.05
1.00
0.95
0.90
10
100
1000
Phase (meas/model) [deg]
4
2
0
−2
−4
Median
68% C.I.
Frequency (Hz)

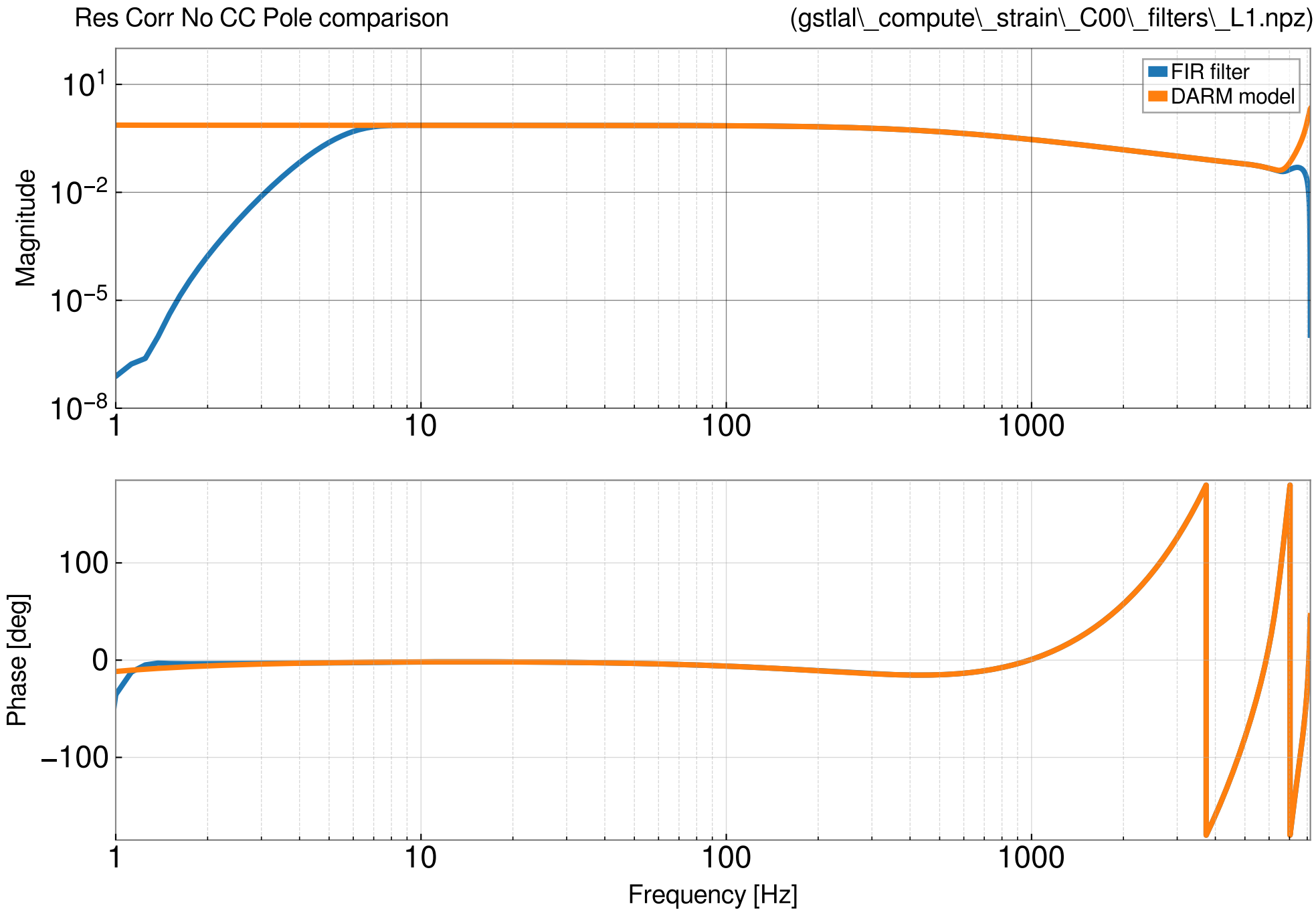

Actuation/L2/EX GPR
20240518T183037Z
20240420T220031Z
20240413T183034Z
20240408T200652Z
20240405T184947Z
20231216T191421Z
20231206T192103Z
20231109T000803Z
20231025T205658Z
20231004T192543Z
20230927T190150Z
20230802T000303Z
20230629T214925Z
20230620T220506Z
20230613T142312Z
20230519T153633Z
20230502T224106Z
20230428T064807Z
20230412T175621Z
Mag (meas/model)
1.10
1.05
1.00
0.95
0.90
10
100
1000
Phase (meas/model) [deg]
4
2
0
−2
−4
Median
68% C.I.
Frequency (Hz)

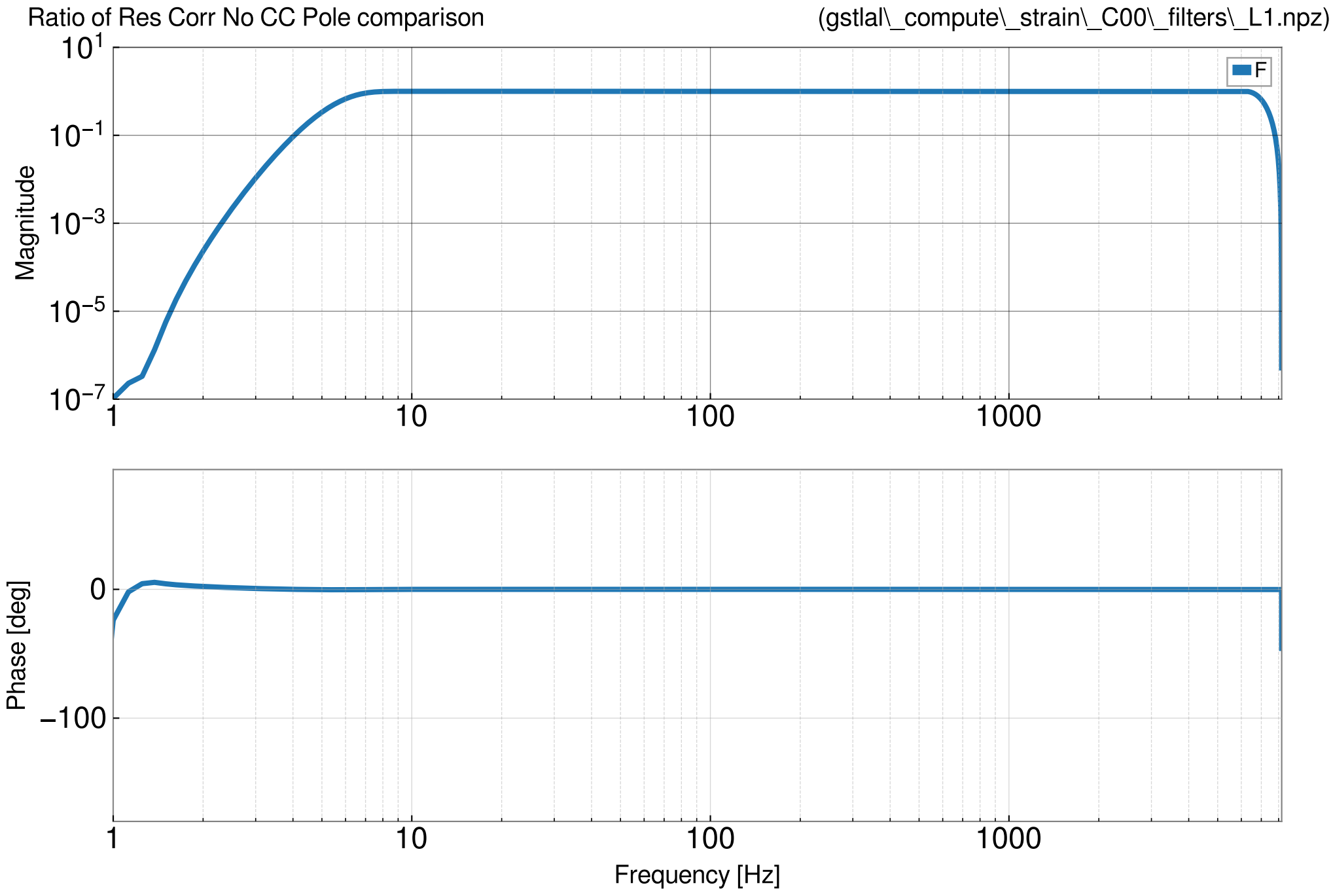

Actuation/L3/EX GPR
20240518T183037Z
20240420T220031Z
20240413T183034Z
20240408T200652Z
20240405T184947Z
20231216T191421Z
20231206T192103Z
20231109T000803Z
20231025T205658Z
20231004T192543Z
20230927T190150Z
20230802T000303Z
20230629T214925Z
20230620T220506Z
20230613T142312Z
20230519T153633Z
20230502T224106Z
20230428T064807Z
20230412T175621Z
Mag (meas/model)
1.10
1.05
1.00
0.95
0.90
10
100
1000
Phase (meas/model) [deg]
4
2
0
−2
−4
Median
68% C.I.
Frequency (Hz)

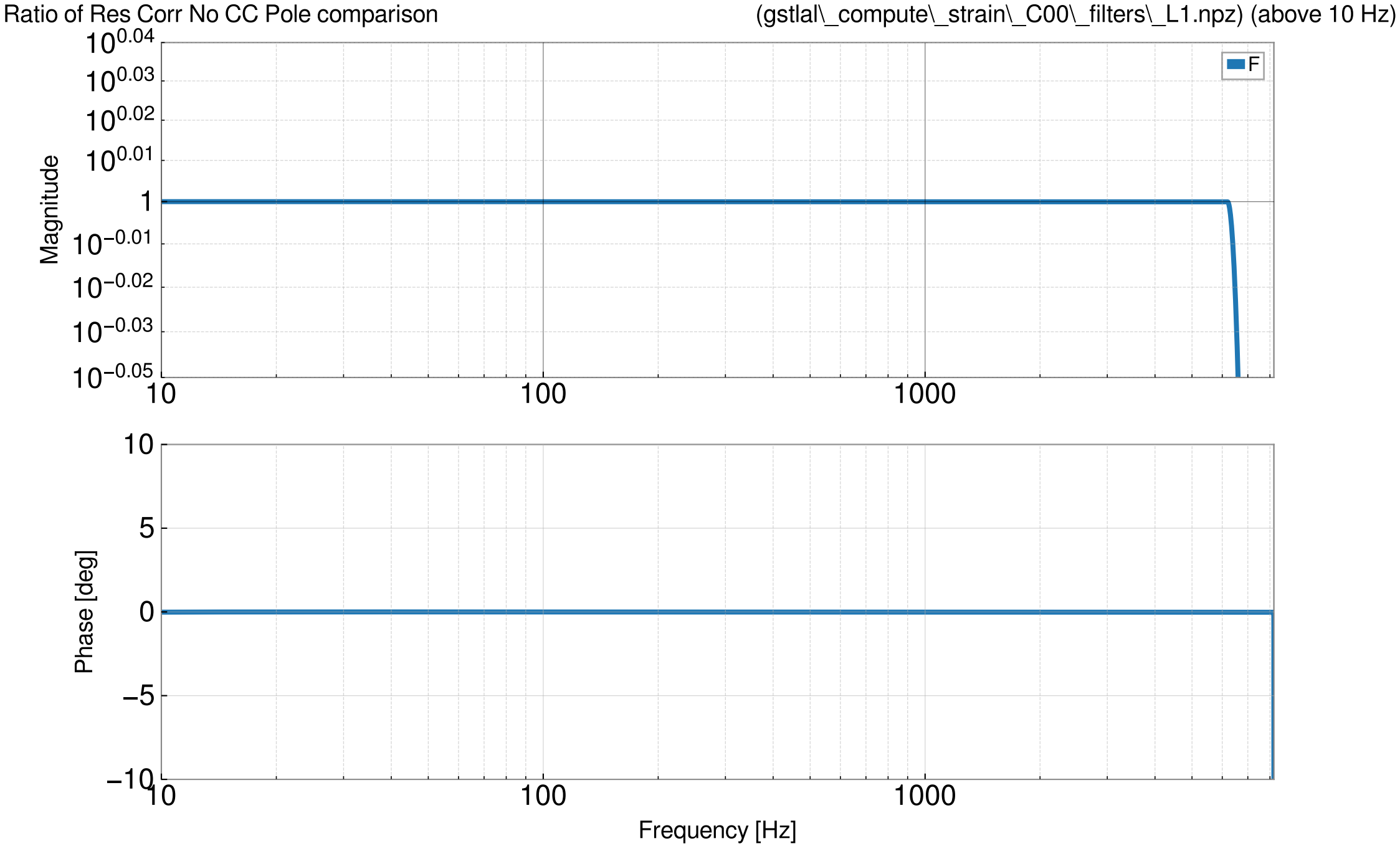

Res Corr comparison (gstlal_compute_strain_C00_filters_L1.npz)
FIR filter
DARM model
Magnitude
10^{1}
10^{-2}
10^{-5}
10^{-8}
1
10
100
1000
Phase [deg]
100
0
−100
1
10
100
1000
Frequency [Hz]

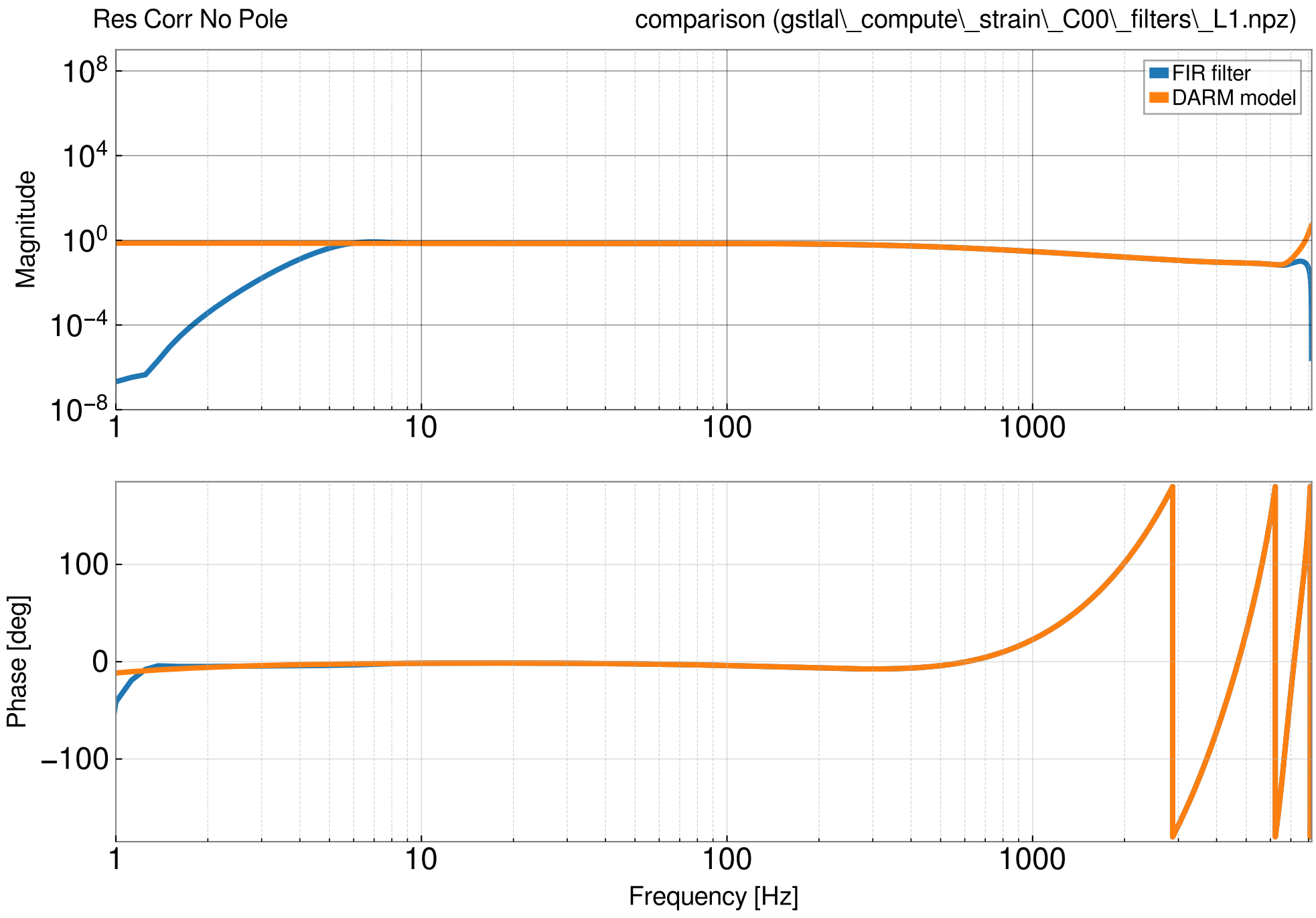

Ratio of Res Corr comparison (gstlal_compute_strain_C00_filters_L1.npz)
Magnitude
10^{1}
10^{-1}
10^{-3}
10^{-5}
10^{-7}
F
1
10
100
1000
Phase [deg]
0
−100
1
10
100
1000
Frequency [Hz]

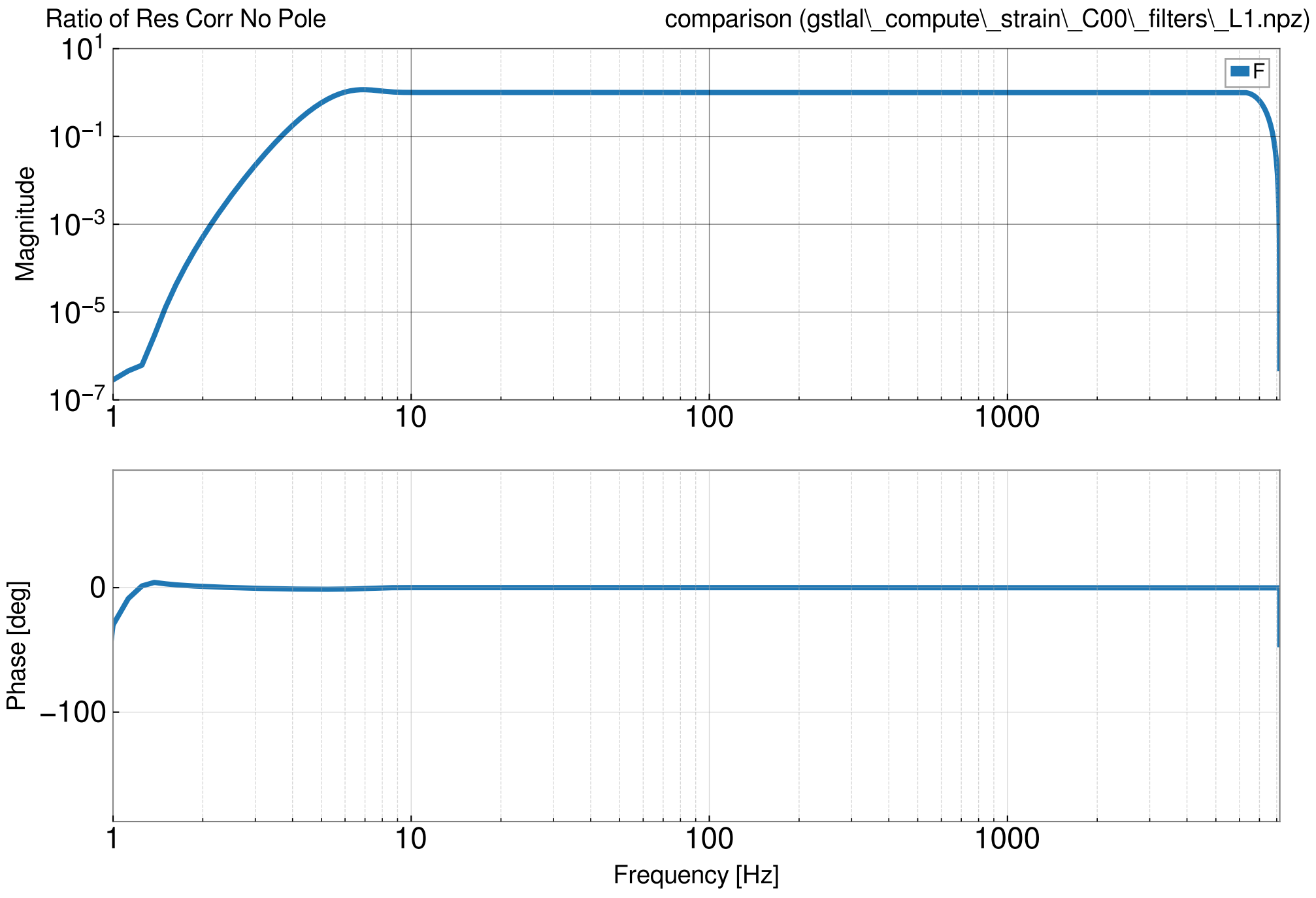

Ratio of Res Corr comparison (gstlal_compute_strain_C00_filters_L1.npz) (above 10 Hz)
Magnitude
$10^{0.04}$
$10^{0.03}$
$10^{0.02}$
$10^{0.01}$
1
$10^{-0.01}$
$10^{-0.02}$
$10^{-0.03}$
$10^{-0.05}$
F
10
100
1000
Phase [deg]
10
5
0
−5
−10
10
100
1000
Frequency [Hz]

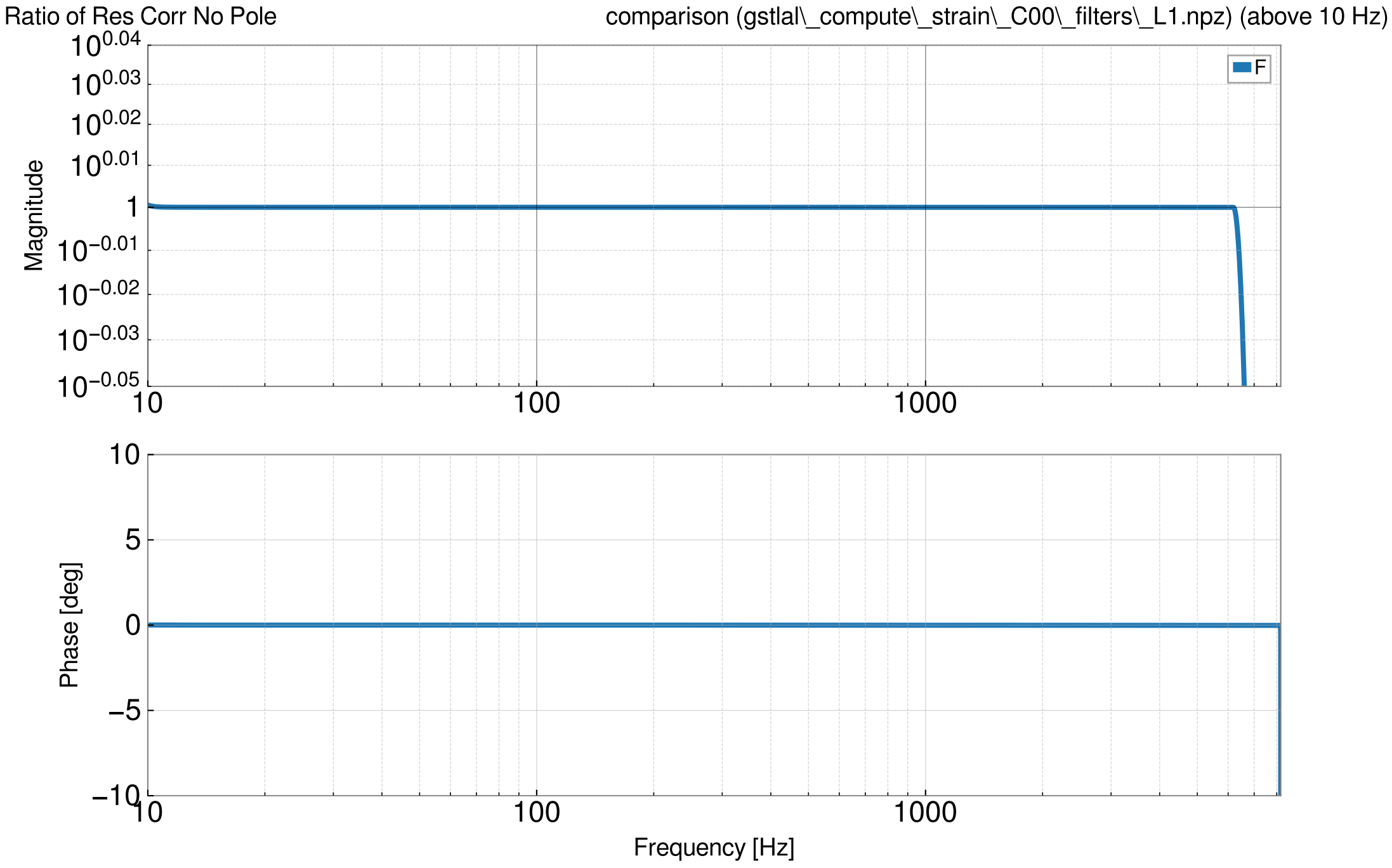

Res Corr No CC Pole comparison
(gstlal_compute_strain_C00_filters_L1.npz)
FIR filter
DARM model
Magnitude
10^{1}
10^{-2}
10^{-5}
10^{-8}
1
10
100
1000
Phase [deg]
100
0
−100
1
10
100
1000
Frequency [Hz]

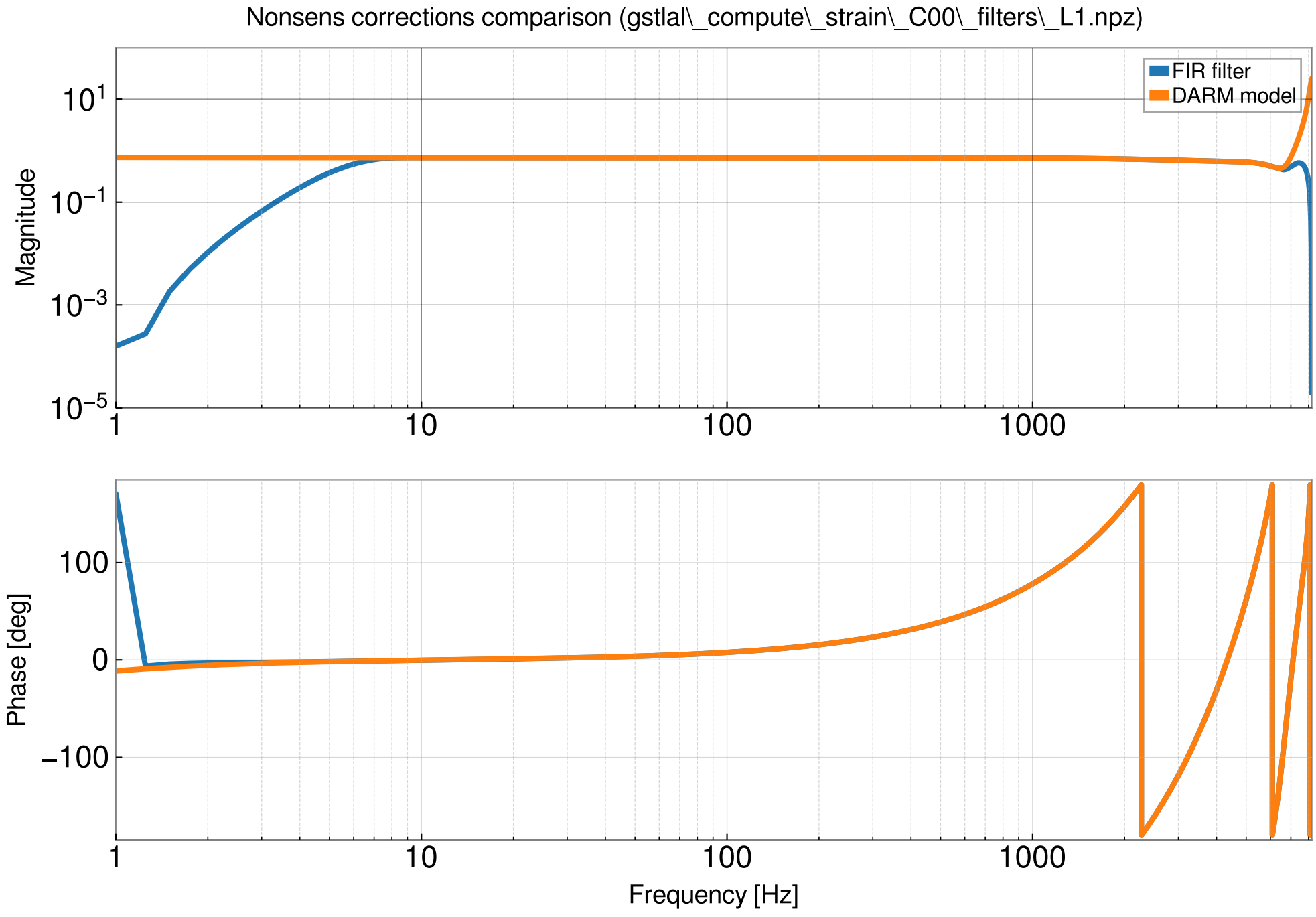

Ratio of Res Corr No CC Pole comparison
(gstlal_compute_strain_C00_filters_L1.npz)
F
Magnitude
10^{1}
10^{-1}
10^{-3}
10^{-5}
10^{-7}
1
10
100
1000
Phase [deg]
0
−100
1
10
100
1000
Frequency [Hz]

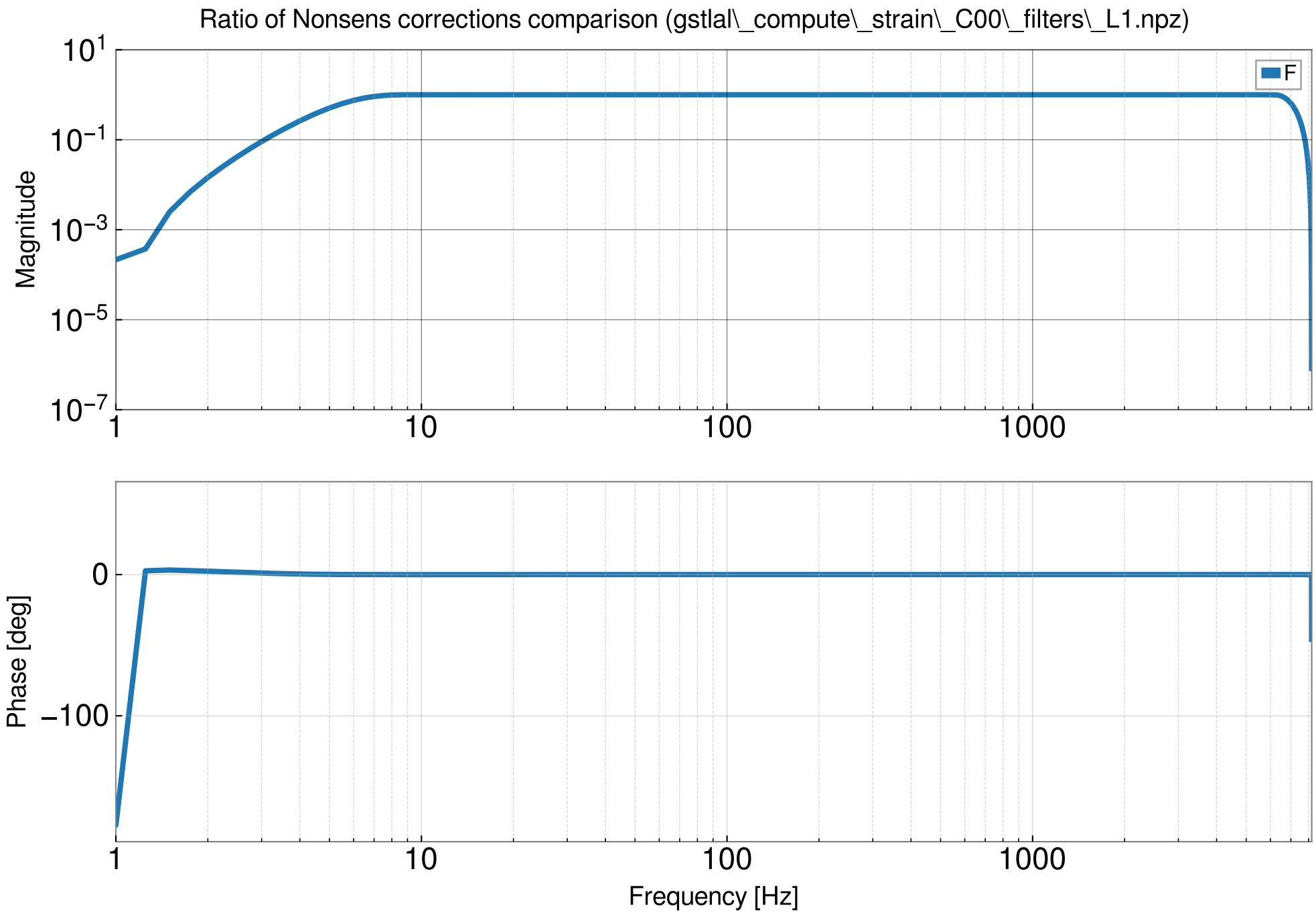

Ratio of Res Corr No CC Pole comparison
(gstlal_compute_strain_C00_filters_L1.npz) (above 10 Hz)
F
Magnitude
$10^{0.04}$
$10^{0.03}$
$10^{0.02}$
$10^{0.01}$
1
$10^{-0.01}$
$10^{-0.02}$
$10^{-0.03}$
$10^{-0.05}$
10
100
1000
Phase [deg]
10
5
0
−5
−10
10
100
1000
Frequency [Hz]

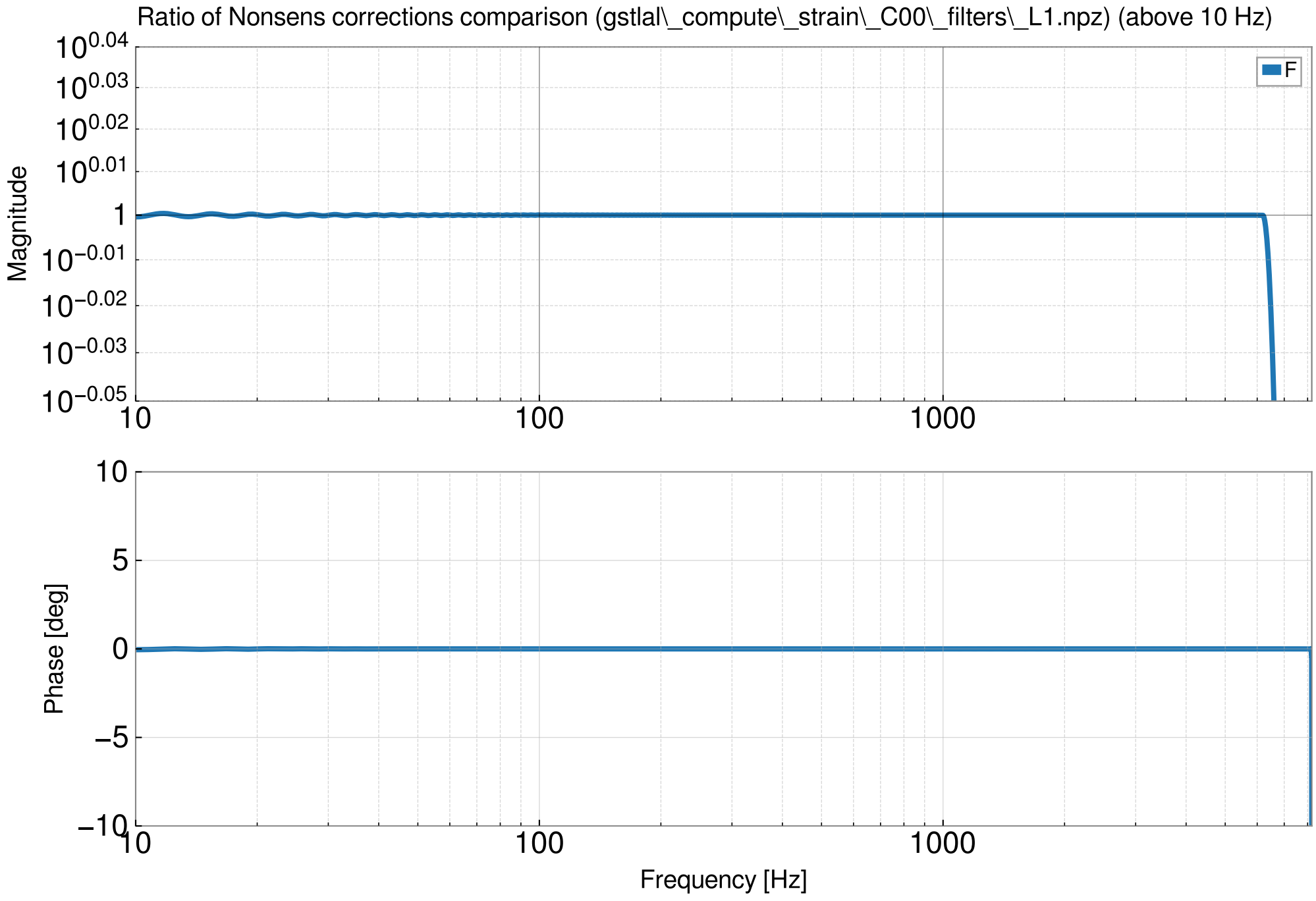

Res Corr No Pole
comparison (gstlal_compute_strain_C00_filters_L1.npz)
FIR filter
DARM model
Magnitude
10^{8}
10^{4}
10^{0}
10^{-4}
10^{-8}
1
10
100
1000
Phase [deg]
100
0
−100
1
10
100
1000
Frequency [Hz]

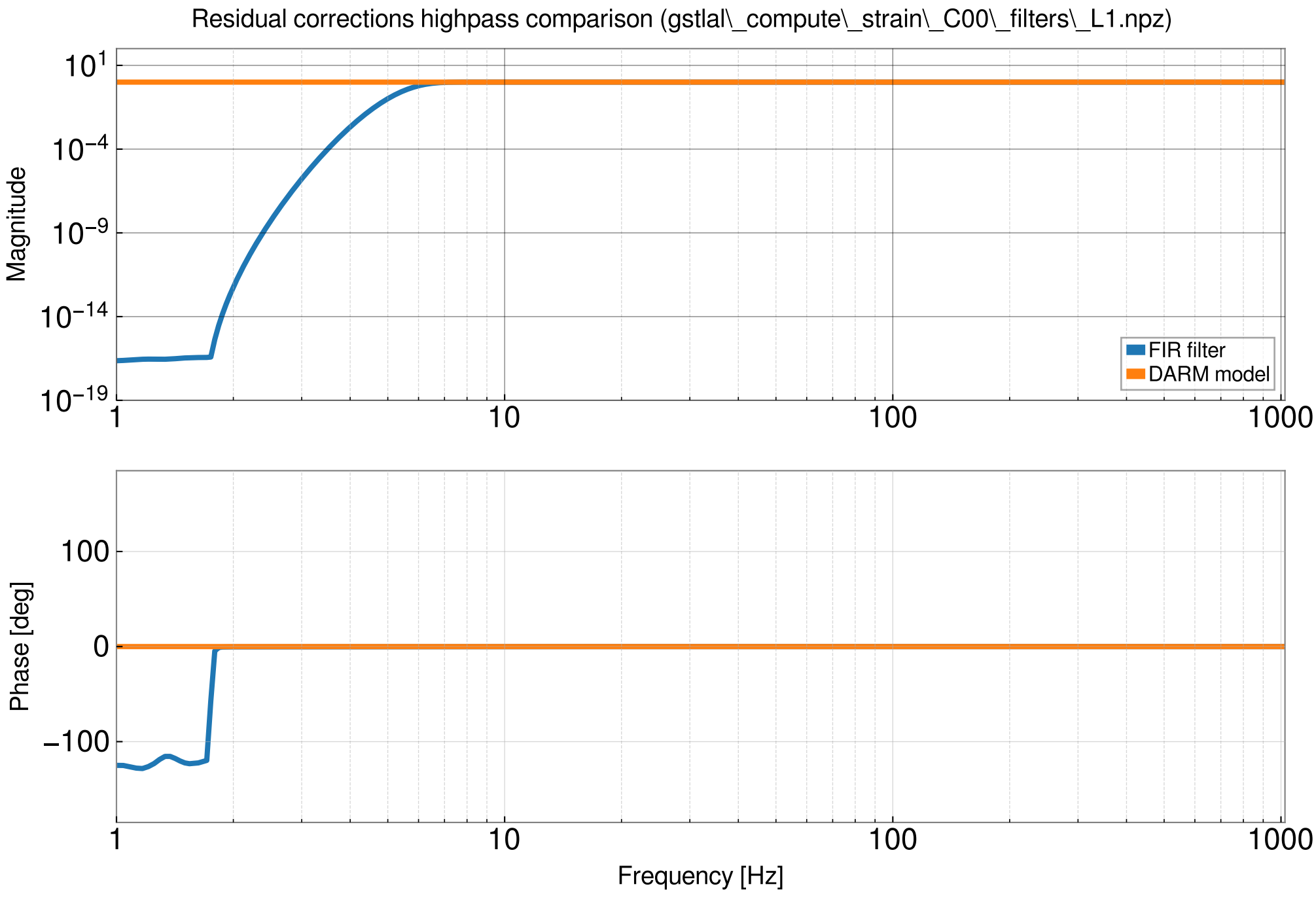

Ratio of Res Corr No Pole
comparison (gstlal_compute_strain_C00_filters_L1.npz)
F
Magnitude
10^{1}
10^{-1}
10^{-3}
10^{-5}
10^{-7}
1
10
100
1000
Phase [deg]
0
−100
1
10
100
1000
Frequency [Hz]

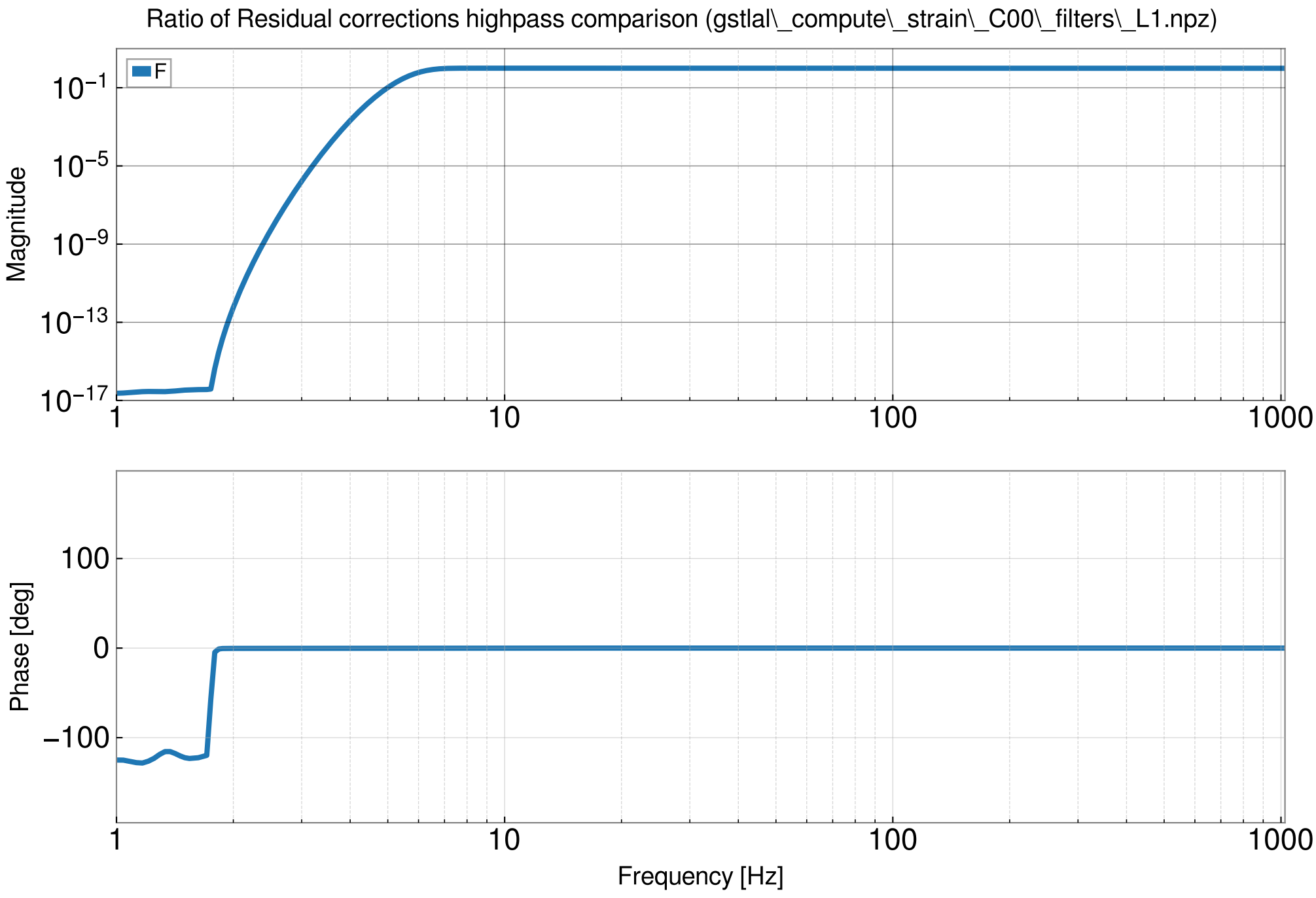

Ratio of Res Corr No Pole
comparison (gstlal_compute_strain_C00_filters_L1.npz) (above 10 Hz)
F
Magnitude
$10^{0.04}$
$10^{0.03}$
$10^{0.02}$
$10^{0.01}$
1
$10^{-0.01}$
$10^{-0.02}$
$10^{-0.03}$
$10^{-0.05}$
10
100
1000
Phase [deg]
10
5
0
−5
−10
10
100
1000
Frequency [Hz]

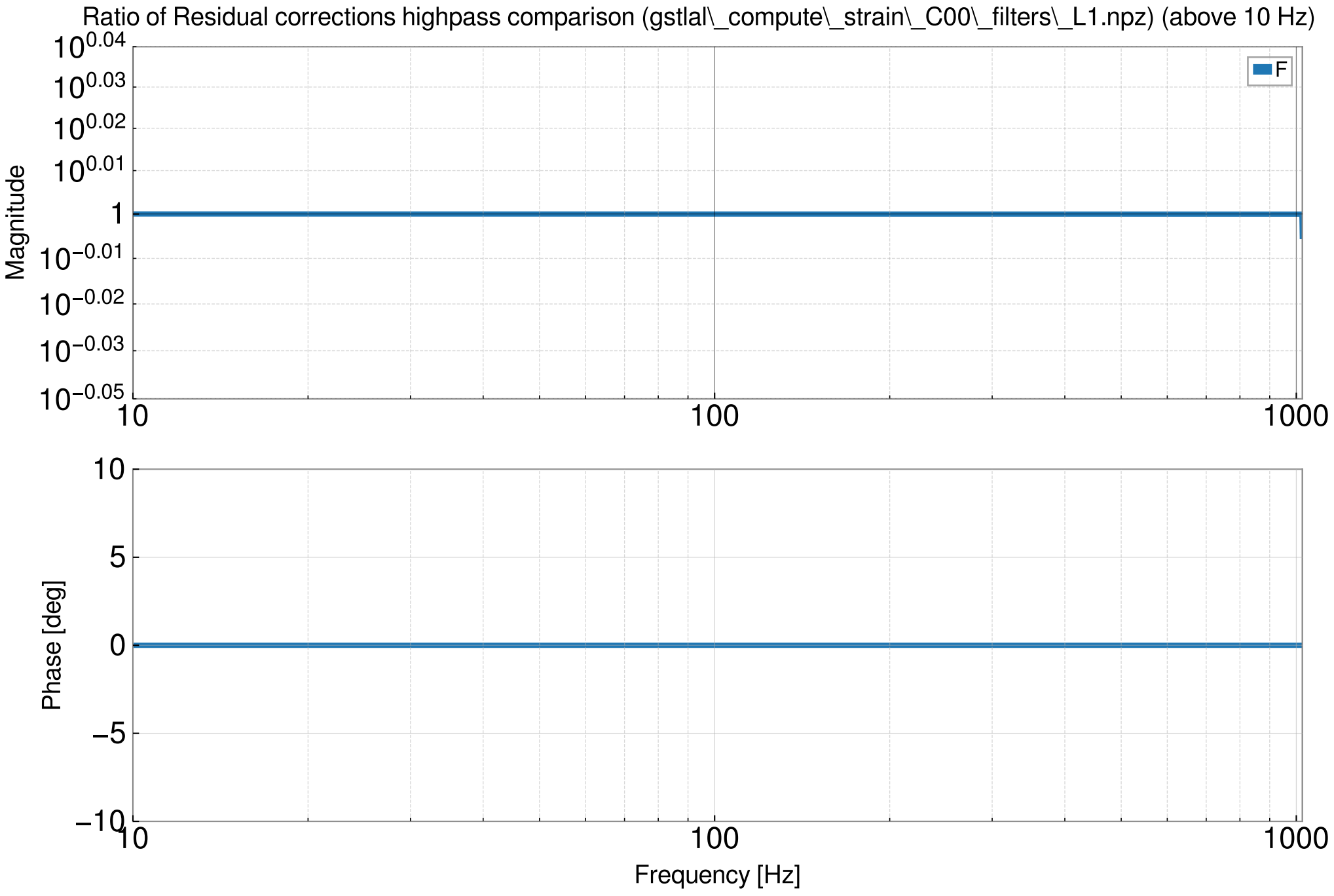

Nonsens corrections comparison (gstlal_compute_strain_C00_filters_L1.npz)
FIR filter
DARM model
Magnitude
10^{1}
10^{-1}
10^{-3}
10^{-5}
1
10
100
1000
Phase [deg]
100
0
−100
1
10
100
1000
Frequency [Hz]

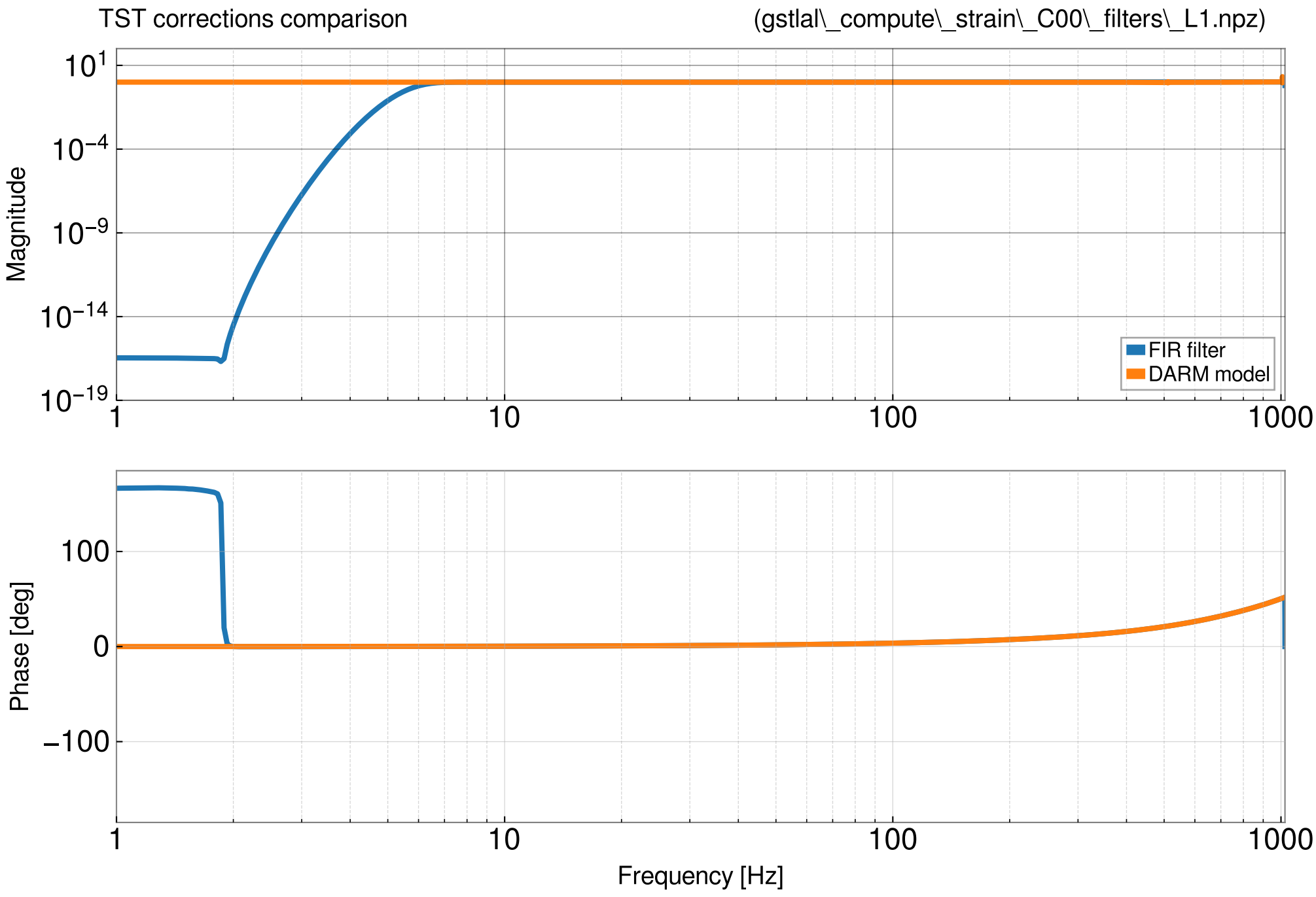

Ratio of Nonsens corrections comparison (gstlal_compute_strain_C00_filters_L1.npz)
Magnitude
10^{1}
10^{-1}
10^{-3}
10^{-5}
10^{-7}
F
1
10
100
1000
Phase [deg]
0
−100
1
10
100
1000
Frequency [Hz]

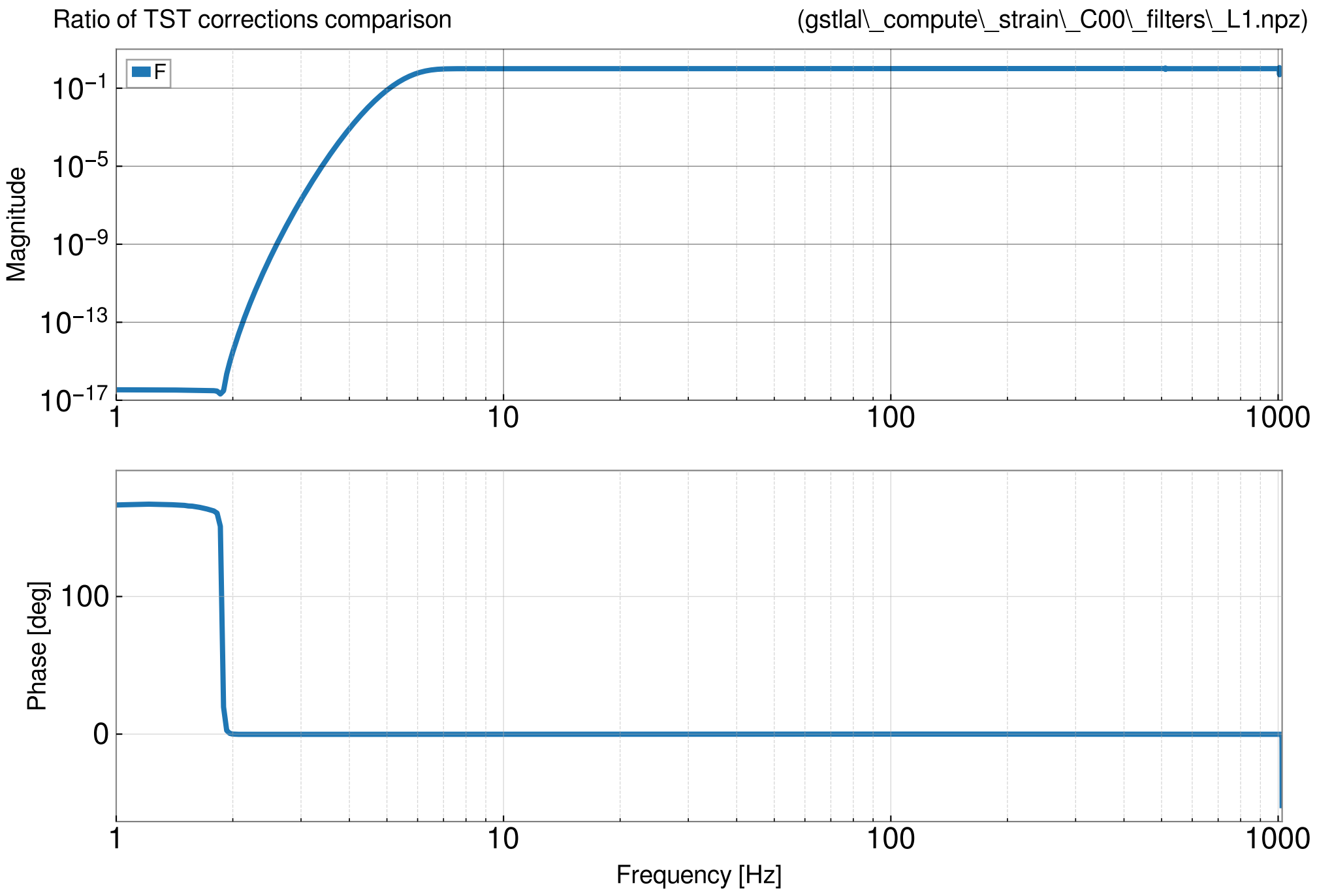

Ratio of Nonsens corrections comparison (gstlal_compute_strain_C00_filters_L1.npz) (above 10 Hz)
F
Magnitude
$10^{0.04}$
$10^{0.03}$
$10^{0.02}$
$10^{0.01}$
1
$10^{-0.01}$
$10^{-0.02}$
$10^{-0.03}$
$10^{-0.05}$
10
100
1000
Phase [deg]
10
5
0
−5
−10
10
100
1000
Frequency [Hz]

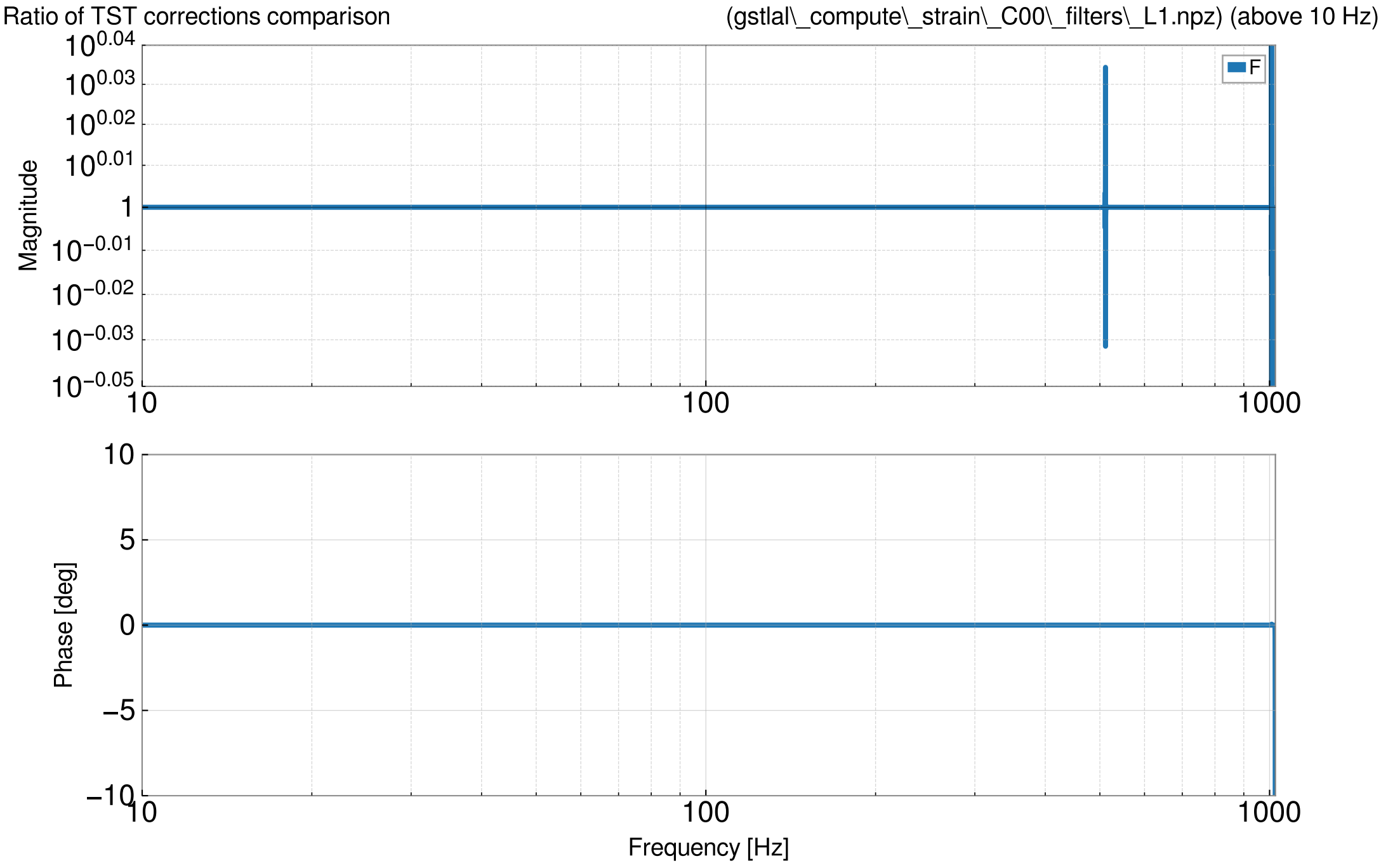

Residual corrections highpass comparison (gstlal_compute_strain_C00_filters_L1.npz)
Magnitude
10^{1}
10^{-4}
10^{-9}
10^{-14}
10^{-19}
1
10
100
1000
FIR filter
DARM model
Phase [deg]
100
0
−100
1
10
100
1000
Frequency [Hz]

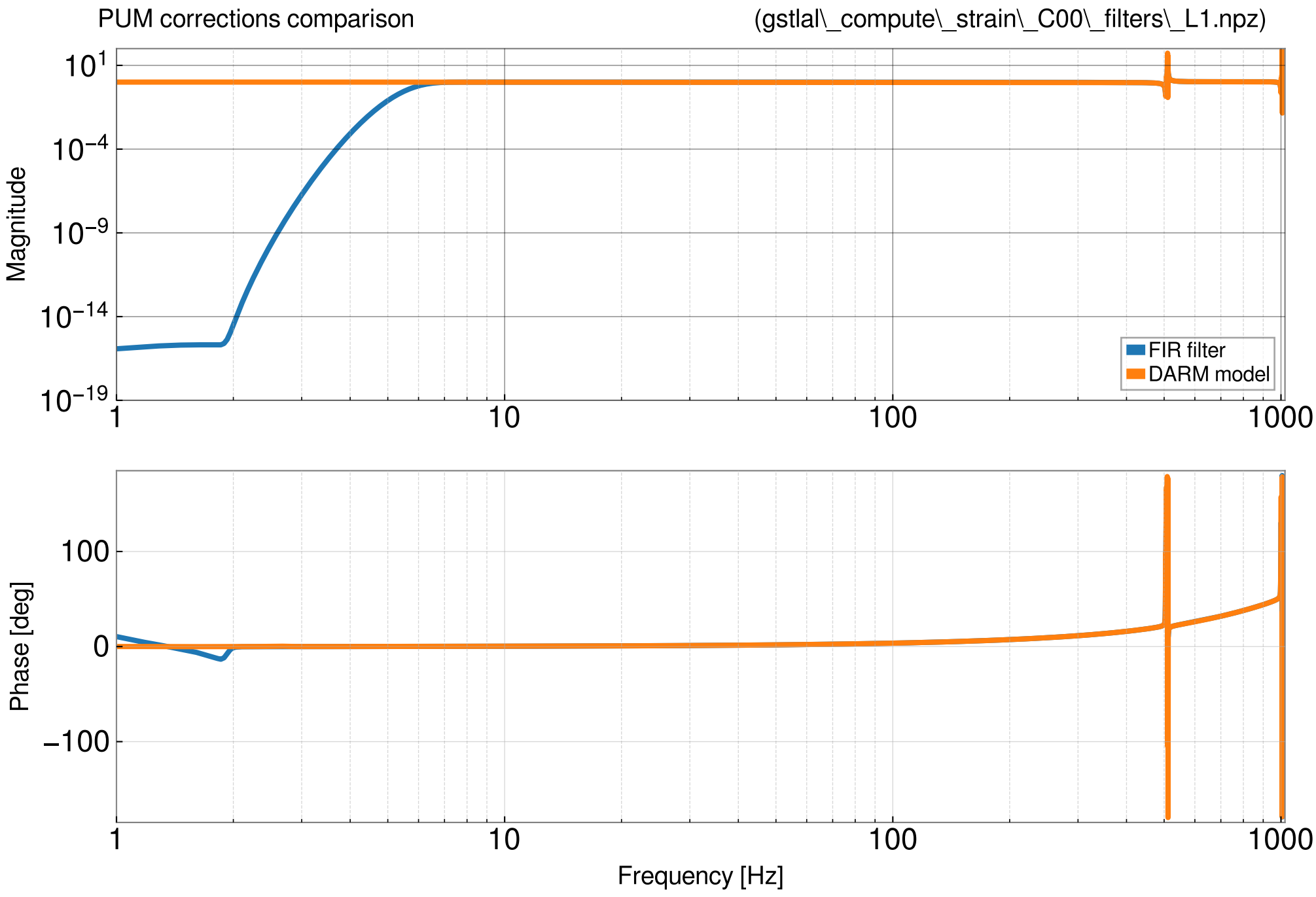

Ratio of Residual corrections highpass comparison (gstlal_compute_strain_C00_filters_L1.npz)
F
Magnitude
10^{-1}
10^{-5}
10^{-9}
10^{-13}
10^{-17}
1
10
100
1000
Phase [deg]
100
0
−100
1
10
100
1000
Frequency [Hz]

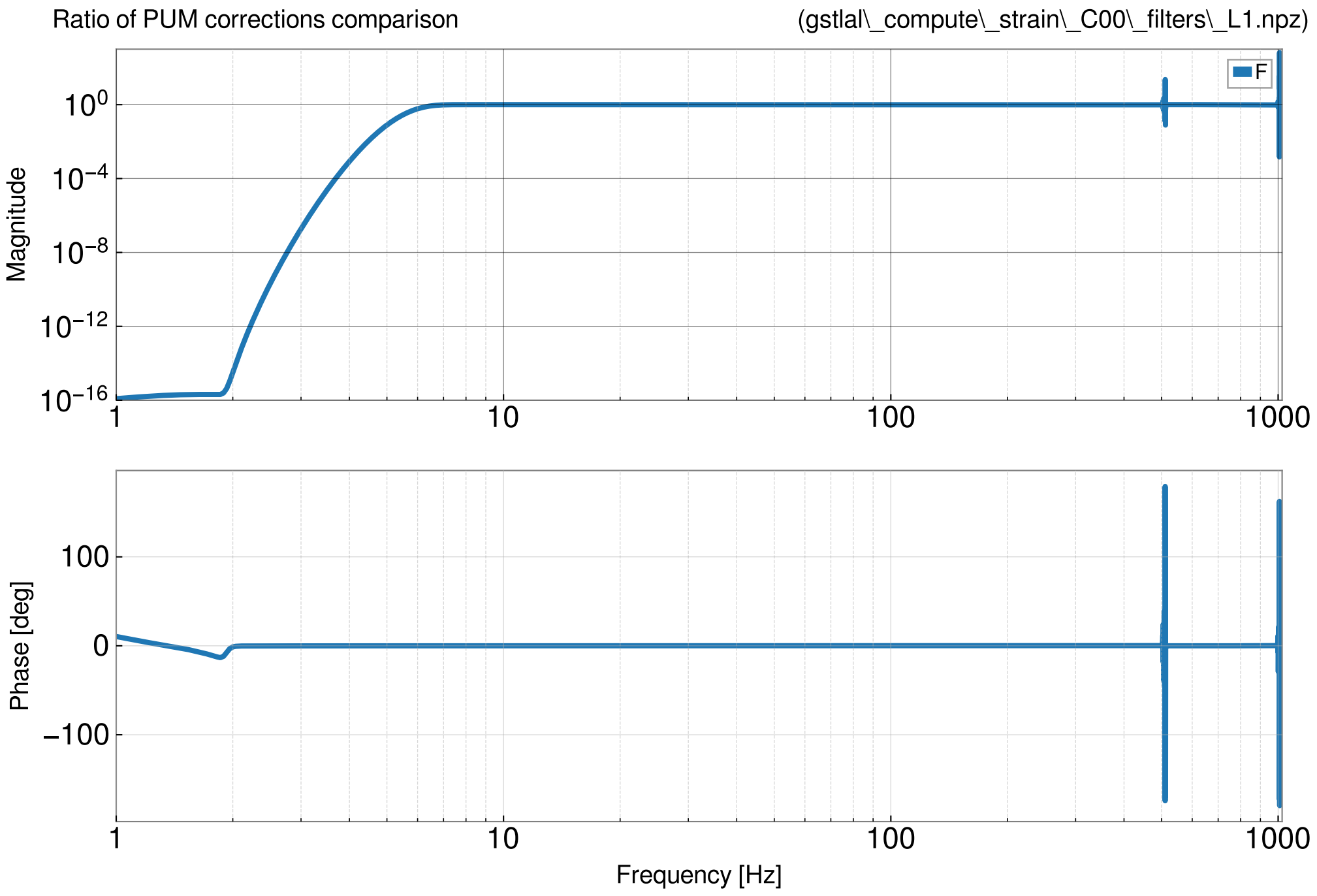

Ratio of Residual corrections highpass comparison (gstlal_compute_strain_C00_filters_L1.npz) (above 10 Hz)
Magnitude
$10^{0.04}$
$10^{0.03}$
$10^{0.02}$
$10^{0.01}$
1
$10^{-0.01}$
$10^{-0.02}$
$10^{-0.03}$
$10^{-0.05}$
F
10
100
1000
Phase [deg]
10
5
0
−5
−10
10
100
1000
Frequency [Hz]

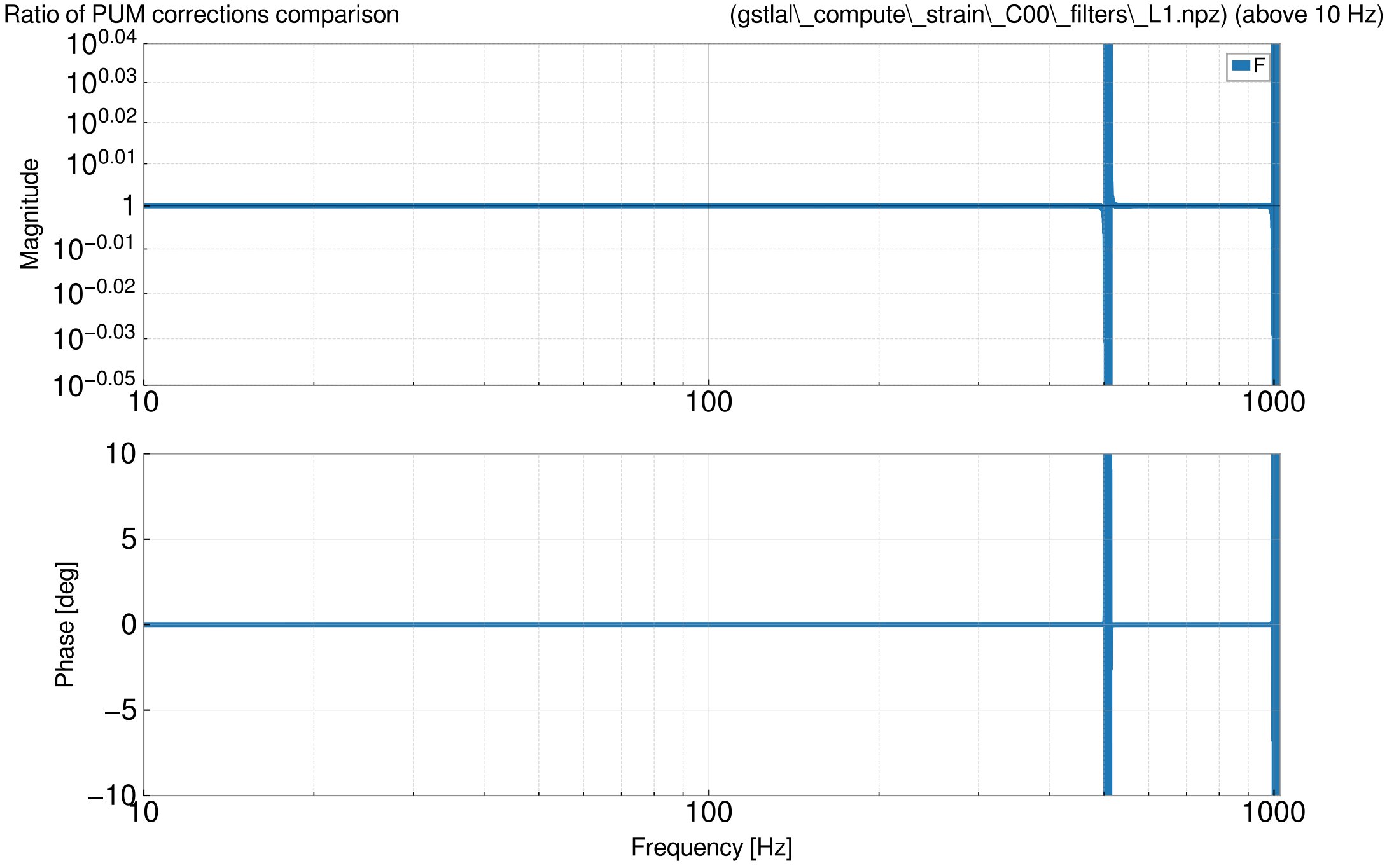

TST corrections comparison
(gstlal_compute_strain_C00_filters_L1.npz)
Magnitude
10^{1}
10^{-4}
10^{-9}
10^{-14}
10^{-19}
FIR filter
DARM model
1
10
100
1000
Phase [deg]
100
0
−100
1
10
100
1000
Frequency [Hz]

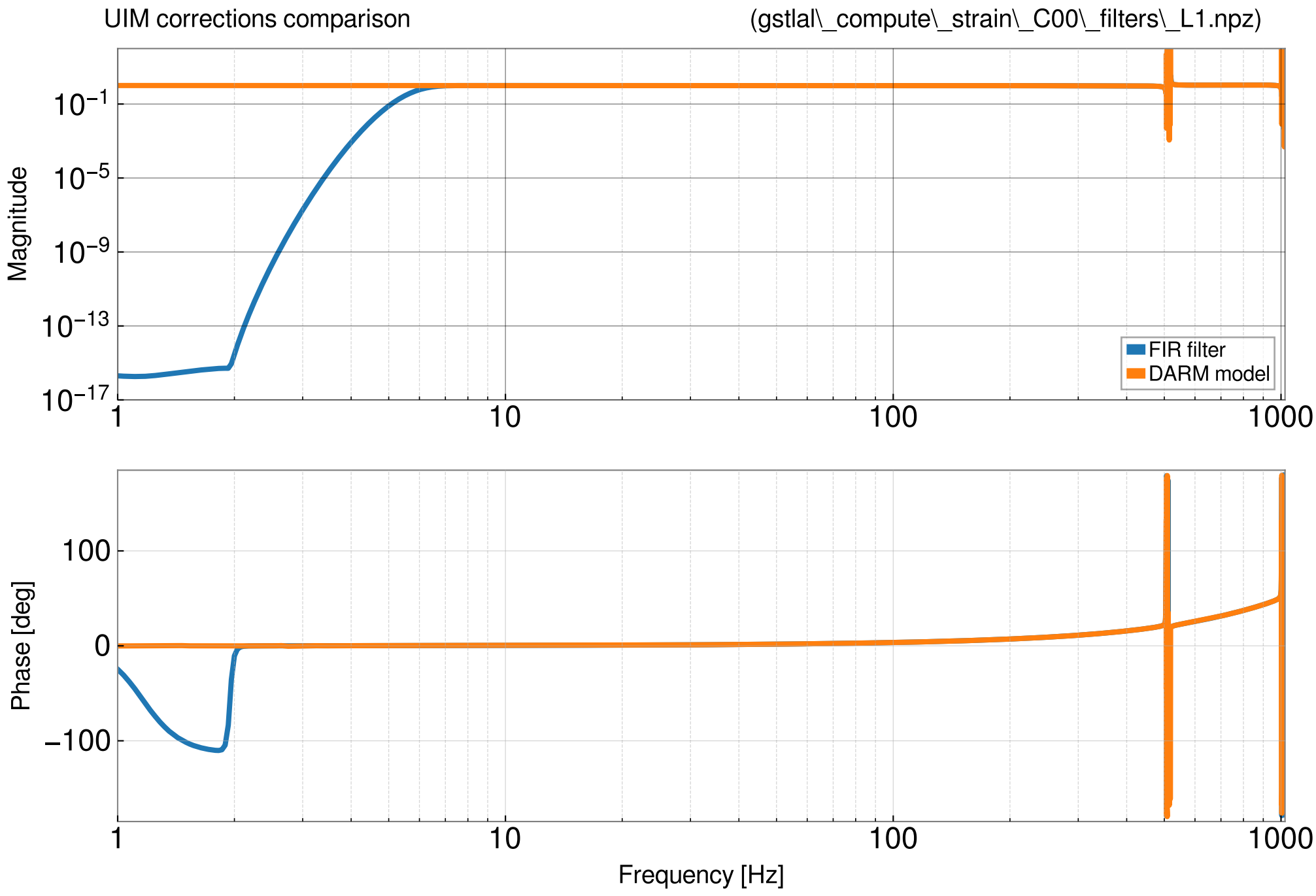

Ratio of TST corrections comparison
(gstlal_compute_strain_C00_filters_L1.npz)
F
Magnitude
10^{-1}
10^{-5}
10^{-9}
10^{-13}
10^{-17}
1
10
100
1000
Phase [deg]
100
0
1
10
100
1000
Frequency [Hz]

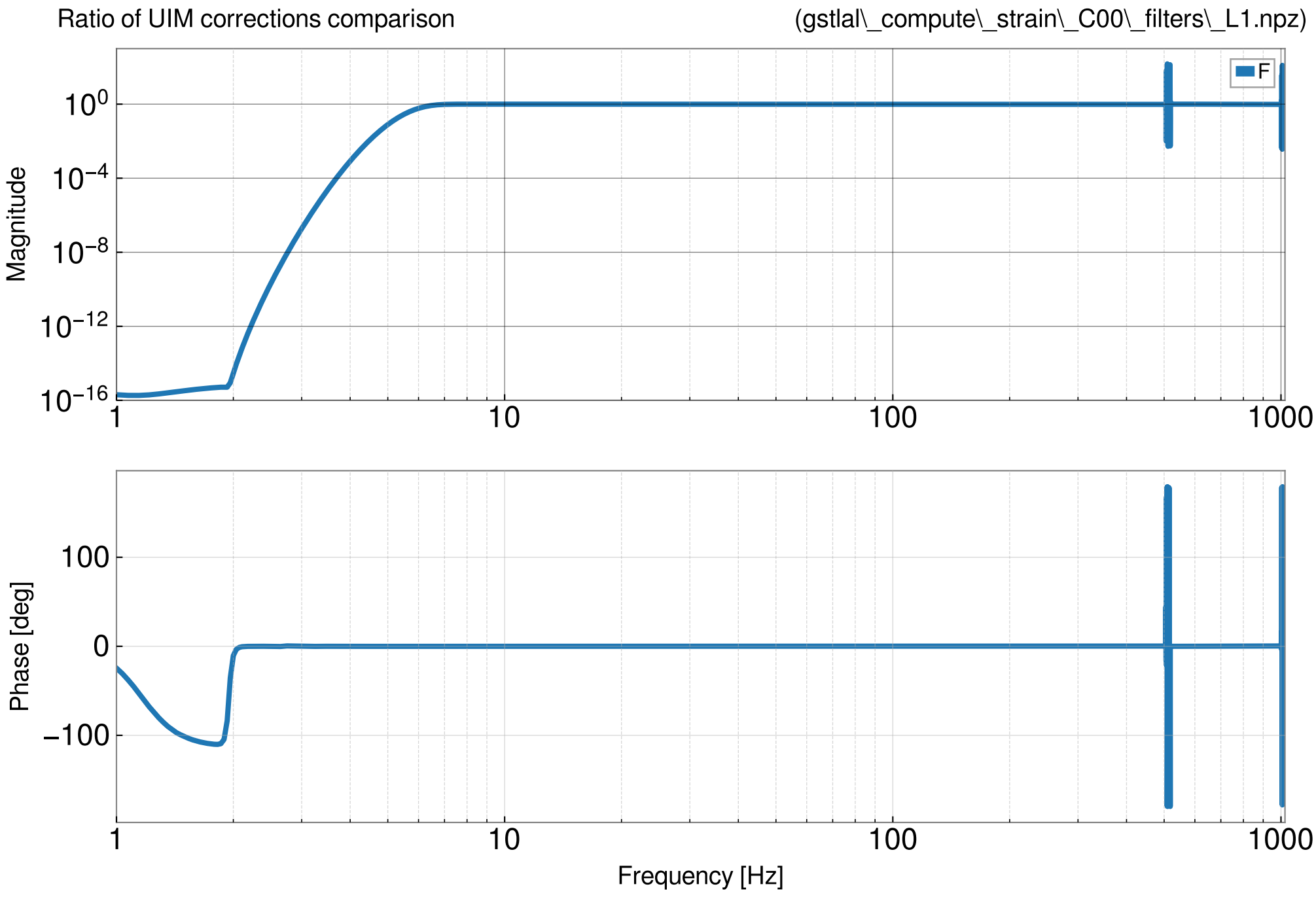

Ratio of TST corrections comparison
(gstlal_compute_strain_C00_filters_L1.npz) (above 10 Hz)
F
Magnitude
$10^{0.04}$
$10^{0.03}$
$10^{0.02}$
$10^{0.01}$
1
$10^{-0.01}$
$10^{-0.02}$
$10^{-0.03}$
$10^{-0.05}$
10
100
1000
Phase [deg]
10
5
0
−5
−10
10
100
1000
Frequency [Hz]

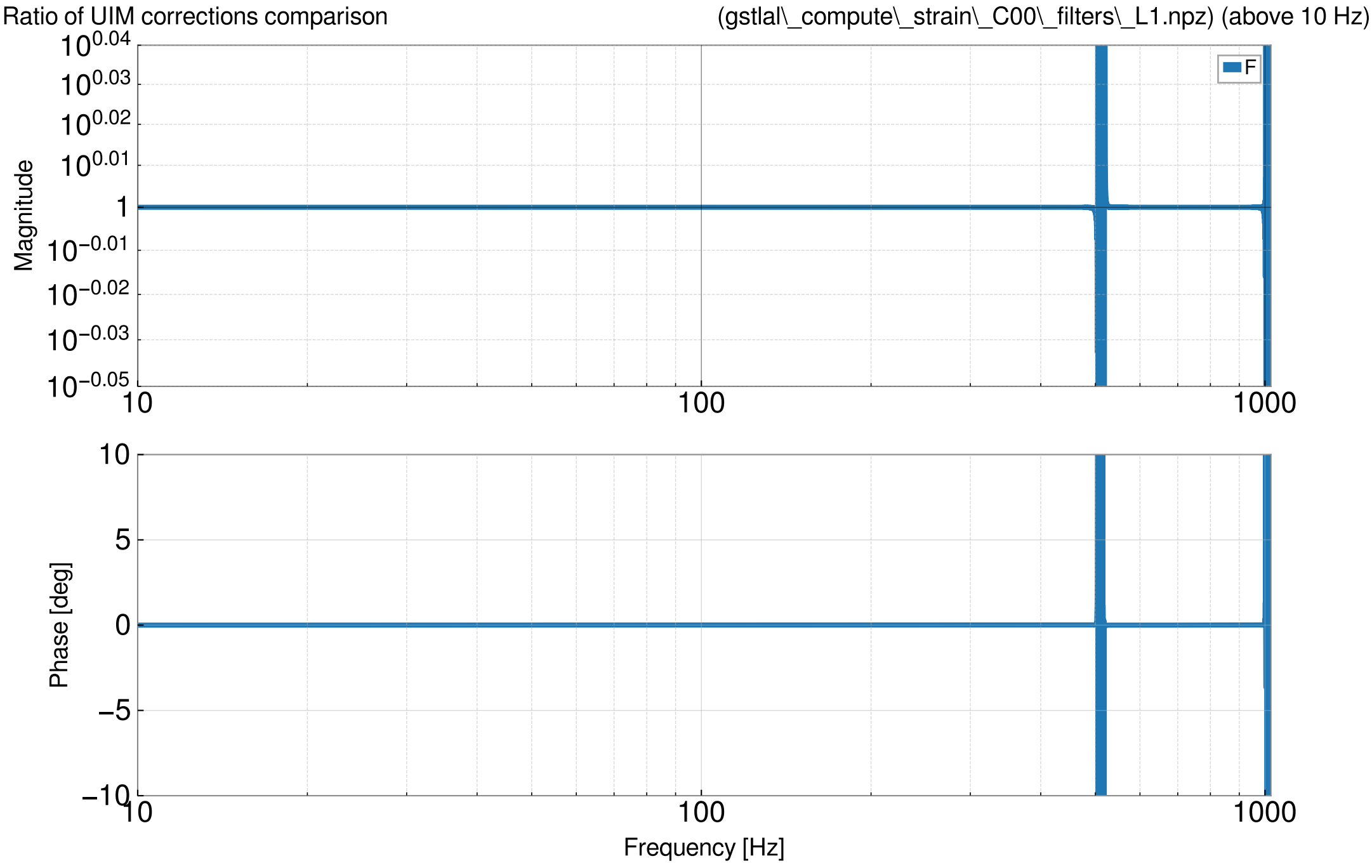

PUM corrections comparison
(gstlal_compute_strain_C00_filters_L1.npz)
Magnitude
10^{1}
10^{-4}
10^{-9}
10^{-14}
10^{-19}
FIR filter
DARM model
1
10
100
1000
Phase [deg]
100
0
−100
1
10
100
1000
Frequency [Hz]


Ratio of PUM corrections comparison
(gstlal_compute_strain_C00_filters_L1.npz)
F
Magnitude
10^{0}
10^{-4}
10^{-8}
10^{-12}
10^{-16}
1
10
100
1000
Phase [deg]
100
0
−100
1
10
100
1000
Frequency [Hz]


Ratio of PUM corrections comparison
(gstlal_compute_strain_C00_filters_L1.npz) (above 10 Hz)
F
Magnitude
$10^{0.04}$
$10^{0.03}$
$10^{0.02}$
$10^{0.01}$
1
$10^{-0.01}$
$10^{-0.02}$
$10^{-0.03}$
$10^{-0.05}$
10
100
1000
Phase [deg]
10
5
0
−5
−10
10
100
1000
Frequency [Hz]


UIM corrections comparison
(gstlal_compute_strain_C00_filters_L1.npz)
Magnitude
10^{-1}
10^{-5}
10^{-9}
10^{-13}
10^{-17}
FIR filter
DARM model
1
10
100
1000
Phase [deg]
100
0
−100
1
10
100
1000
Frequency [Hz]


Ratio of UIM corrections comparison
(gstlal_compute_strain_C00_filters_L1.npz)
F
Magnitude
10^{0}
10^{-4}
10^{-8}
10^{-12}
10^{-16}
1
10
100
1000
Phase [deg]
100
0
−100
1
10
100
1000
Frequency [Hz]


Ratio of UIM corrections comparison
(gstlal_compute_strain_C00_filters_L1.npz) (above 10 Hz)
F
Magnitude
$10^{0.04}$
$10^{0.03}$
$10^{0.02}$
$10^{0.01}$
1
$10^{-0.01}$
$10^{-0.02}$
$10^{-0.03}$
$10^{-0.05}$
10
100
1000
Phase [deg]
10
5
0
−5
−10
10
100
1000
Frequency [Hz]