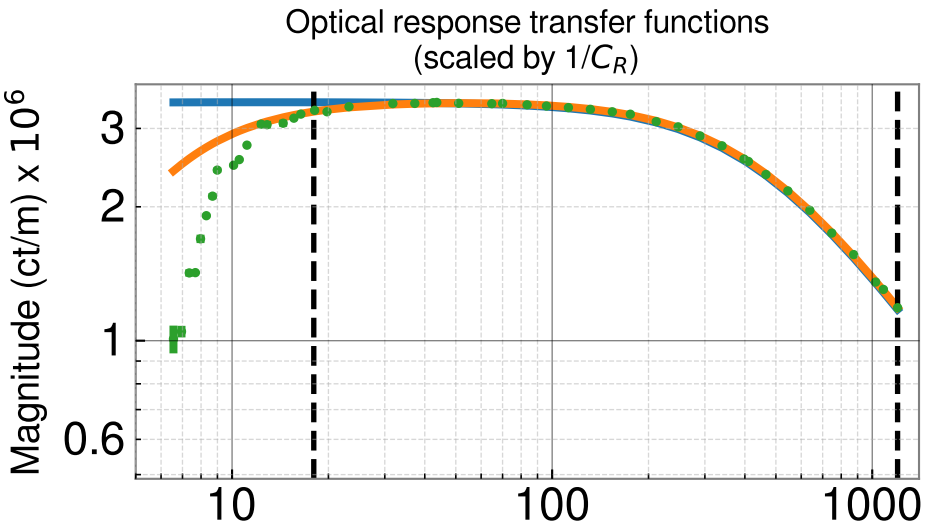
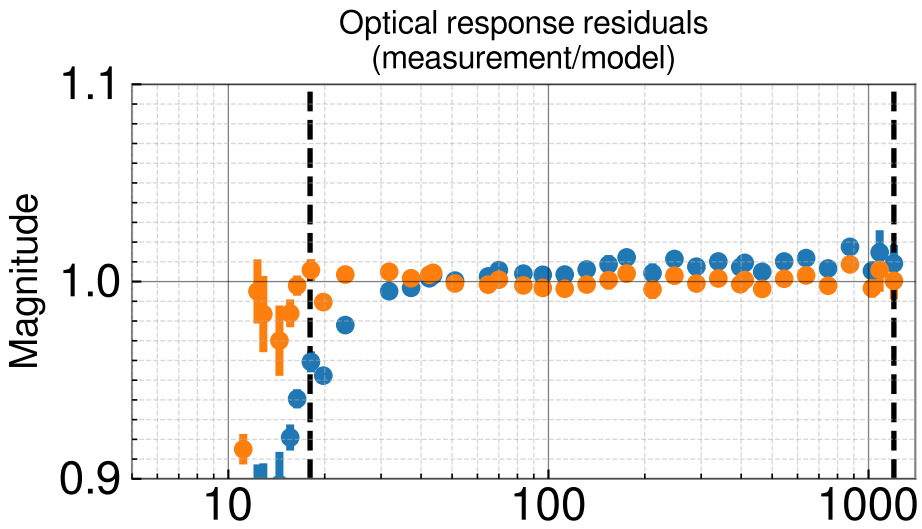
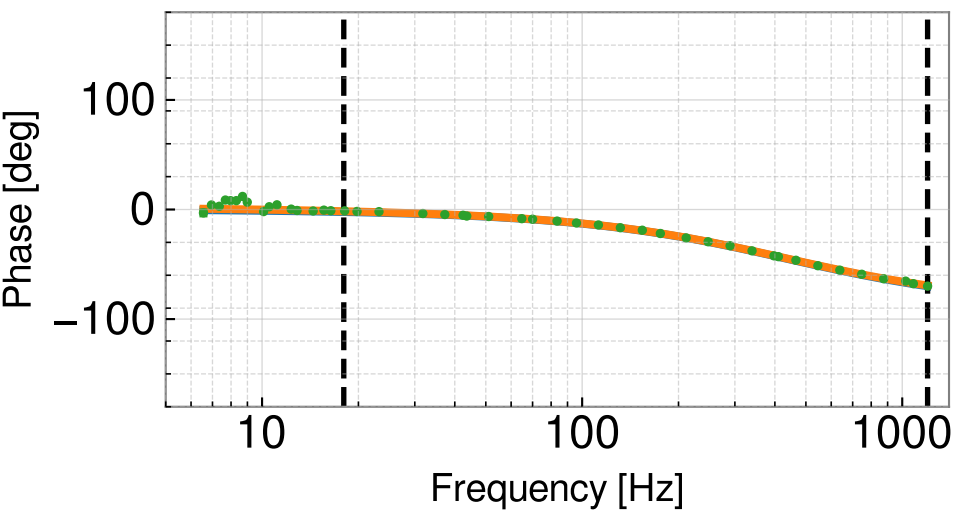
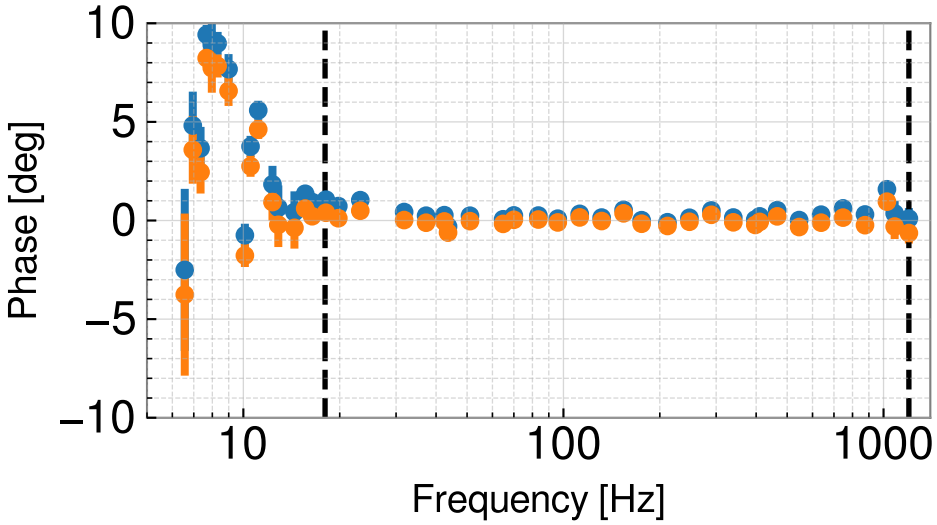
H1 sensing model MCMC summary

All fixed parameters drawn from /ligo/groups/cal/H1/reports/20240601T183705Z/pydarm_H1.ini

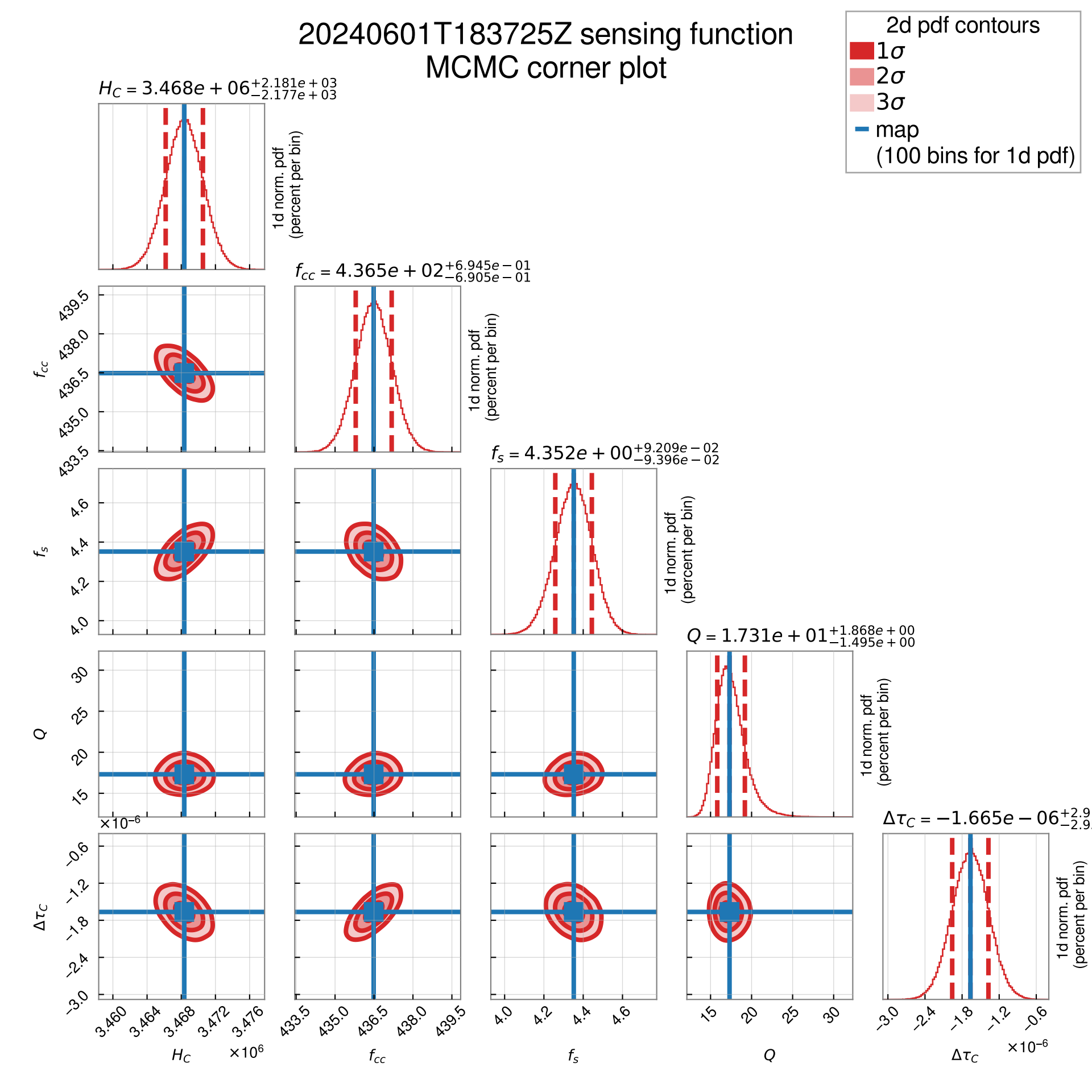


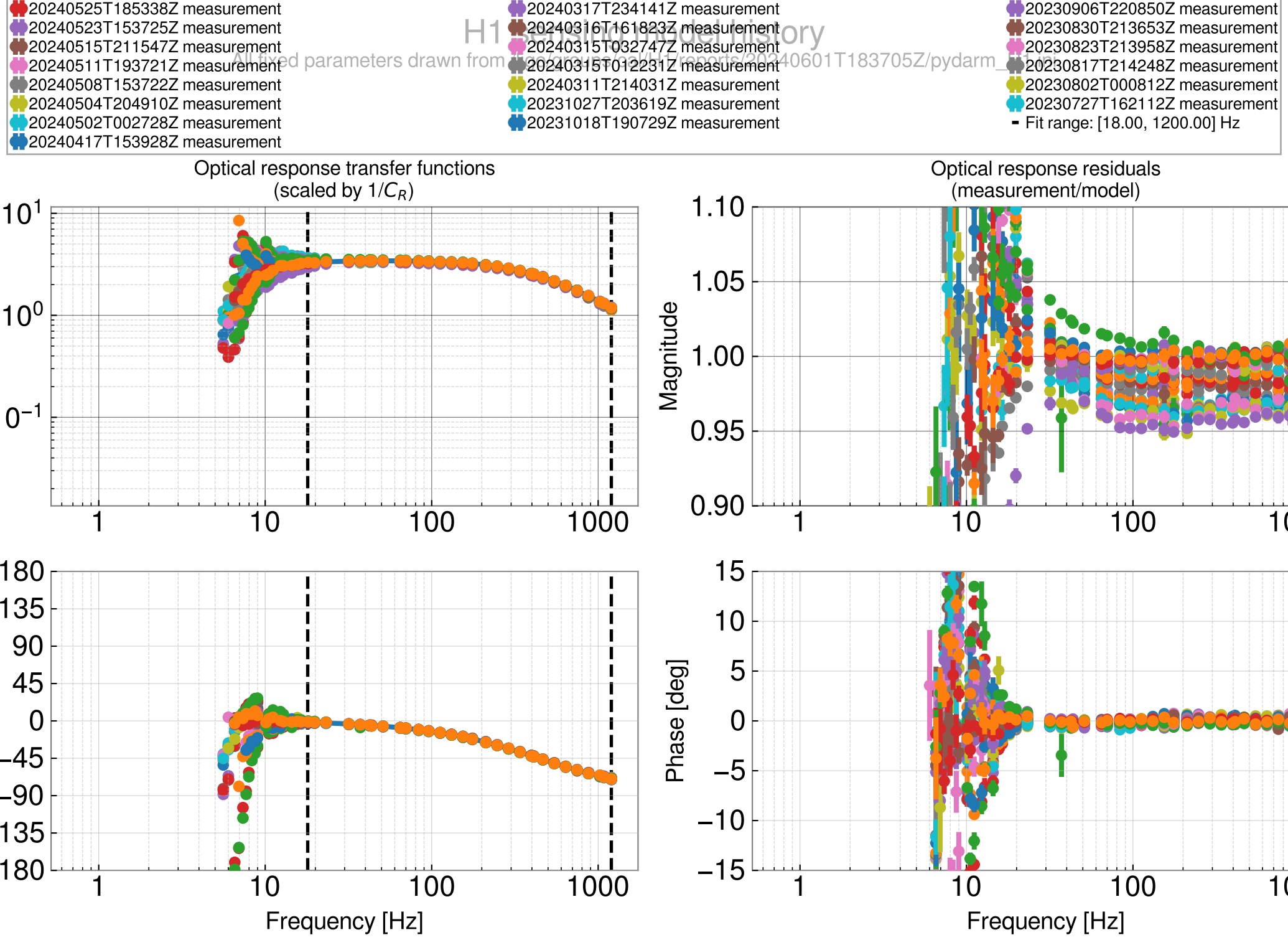


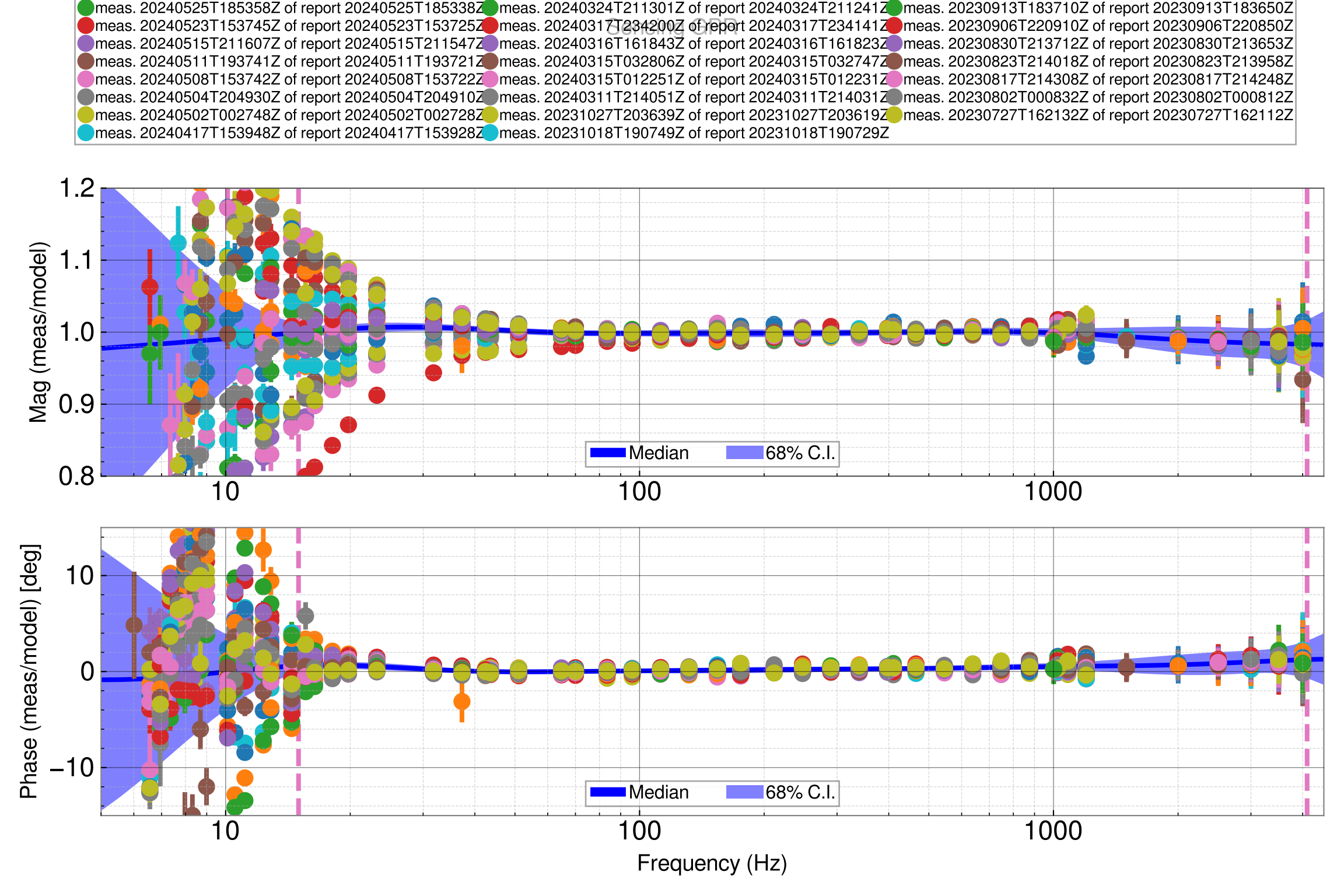




Parameter (value +/-)	value	+	-
Optical gain, H_c (ct/m)	3.468e+06	2181 (0.06%)	2177 (0.06%)
Cavity_pole, f_cc (Hz)	436.5	0.6945 (0.16%)	0.6905 (0.16%)
Detuned SRC spring frequency, f_s (Hz)	4.352	0.09209 (2.12%)	0.09396 (2.16%)
Detuned SRC spring quality factor, Q_s	17.31	1.868 (10.79%)	1.495 (8.64%)
Residual time delay, tau_c (s)	-1.665e-06	2.912e-07 (-17.49%)	2.95e-07 (-17.72%)

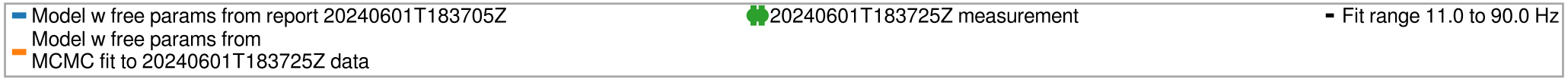

20240601T183725Z sensing function
MCMC corner plot
2d pdf contours
1σ
2σ
3σ
map
(100 bins for 1d pdf)
$H_C = 3.468e+06^{+2.181e+03}_{-2.177e+03}$
$f_{cc} = 4.365e+02^{+6.945e-01}_{-6.905e-01}$
$f_s = 4.352e+00^{+9.209e-02}_{-9.396e-02}$
$Q = 1.731e+01^{+1.868e+00}_{-1.495e+00}$
$\Delta\tau_C = -1.665e-06^{+2.9}_{-2.9}$
1d norm. pdf
(percent per bin)
H_C
f_{cc}
f_s
Q
$\Delta\tau_C$
×10⁶
×10⁻⁶

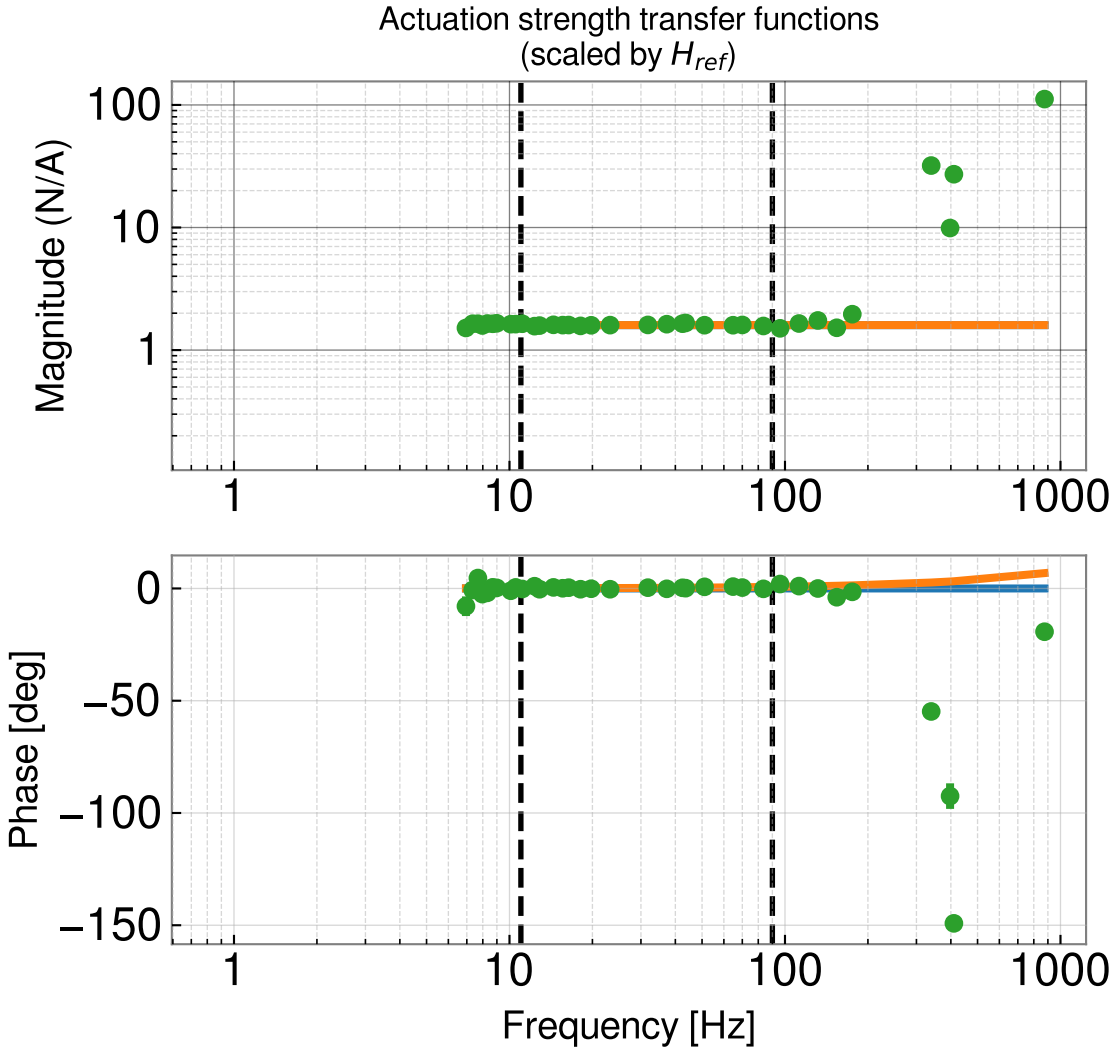

H1 Sensing Model History
All fixed parameters drawn from /ligo/groups/cal/H1/reports/20240601T183705Z/pydarm_H1.ini
20240525T185338Z measurement
20240523T153725Z measurement
20240515T211547Z measurement
20240511T193721Z measurement
20240508T153722Z measurement
20240504T204910Z measurement
20240502T002728Z measurement
20240417T153928Z measurement
20240317T234141Z measurement
20240316T161823Z measurement
20240315T032747Z measurement
20240315T012231Z measurement
20240311T214031Z measurement
20231027T203619Z measurement
20231018T190729Z measurement
20230906T220850Z measurement
20230830T213653Z measurement
20230823T213958Z measurement
20230817T214248Z measurement
20230802T000812Z measurement
20230727T162112Z measurement
Fit range: [18.00, 1200.00] Hz
Optical response transfer functions
(scaled by 1/C_R)
Magnitude (ct/m) x 10^6
Optical response residuals
(measurement/model)
Magnitude
Phase [deg]
Frequency [Hz]

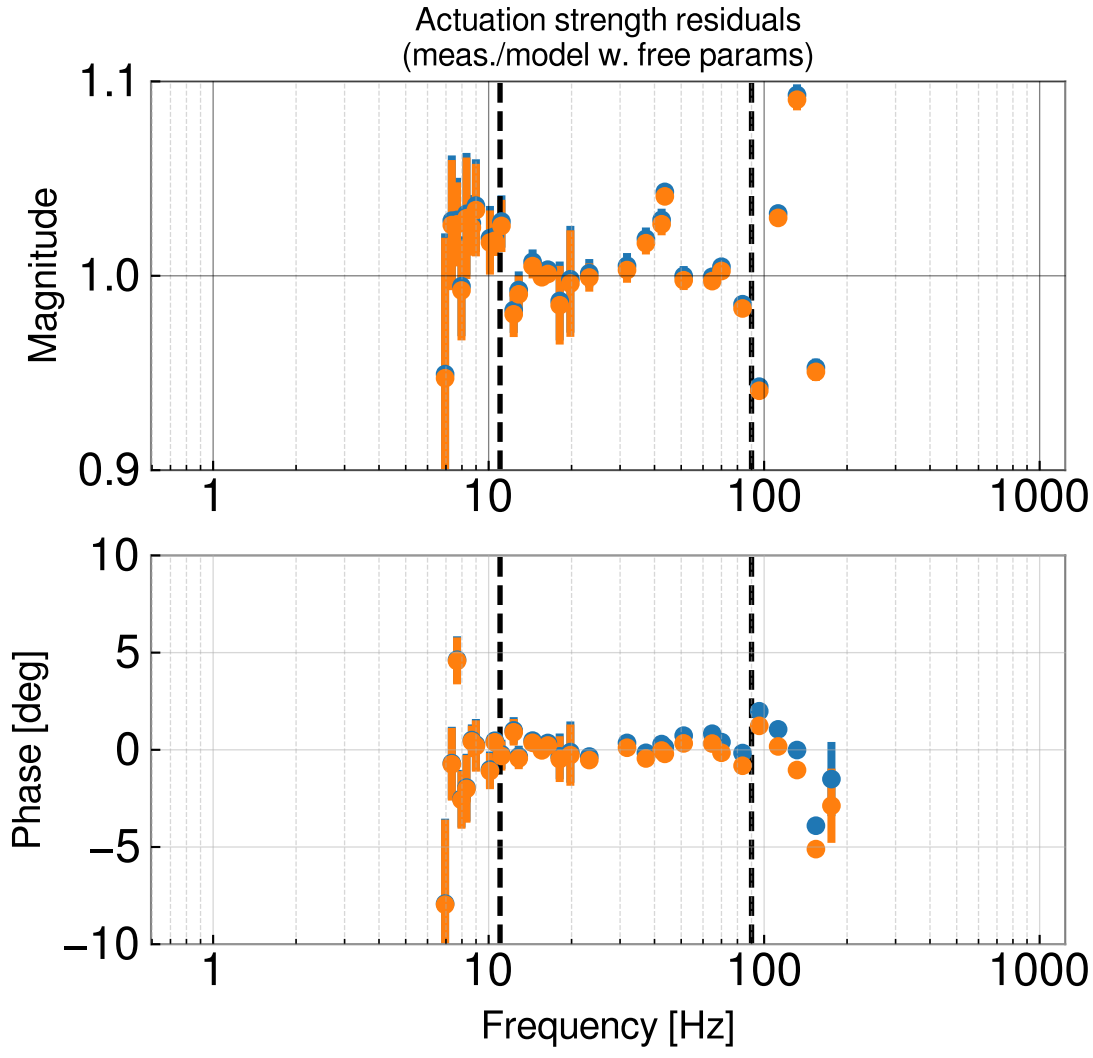

meas. 20240525T185358Z of report 20240525T185338Z
meas. 20240523T153745Z of report 20240523T153725Z
meas. 20240515T211607Z of report 20240515T211547Z
meas. 20240511T193741Z of report 20240511T193721Z
meas. 20240508T153742Z of report 20240508T153722Z
meas. 20240504T204930Z of report 20240504T204910Z
meas. 20240502T002748Z of report 20240502T002728Z
meas. 20240417T153948Z of report 20240417T153928Z
meas. 20240324T211301Z of report 20240324T211241Z
meas. 20240317T234200Z of report 20240317T234141Z
meas. 20240316T161843Z of report 20240316T161823Z
meas. 20240315T032806Z of report 20240315T032747Z
meas. 20240315T012251Z of report 20240315T012231Z
meas. 20240311T214051Z of report 20240311T214031Z
meas. 20231027T203639Z of report 20231027T203619Z
meas. 20231018T190749Z of report 20231018T190729Z
meas. 20230913T183710Z of report 20230913T183650Z
meas. 20230906T220910Z of report 20230906T220850Z
meas. 20230830T213712Z of report 20230830T213653Z
meas. 20230823T214018Z of report 20230823T213958Z
meas. 20230817T214308Z of report 20230817T214248Z
meas. 20230802T000832Z of report 20230802T000812Z
meas. 20230727T162132Z of report 20230727T162112Z
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)

H1SUSEX L1 actuation model MCMC summary

All fixed parameters drawn from /ligo/groups/cal/H1/reports/20240601T183705Z/pydarm_H1.ini

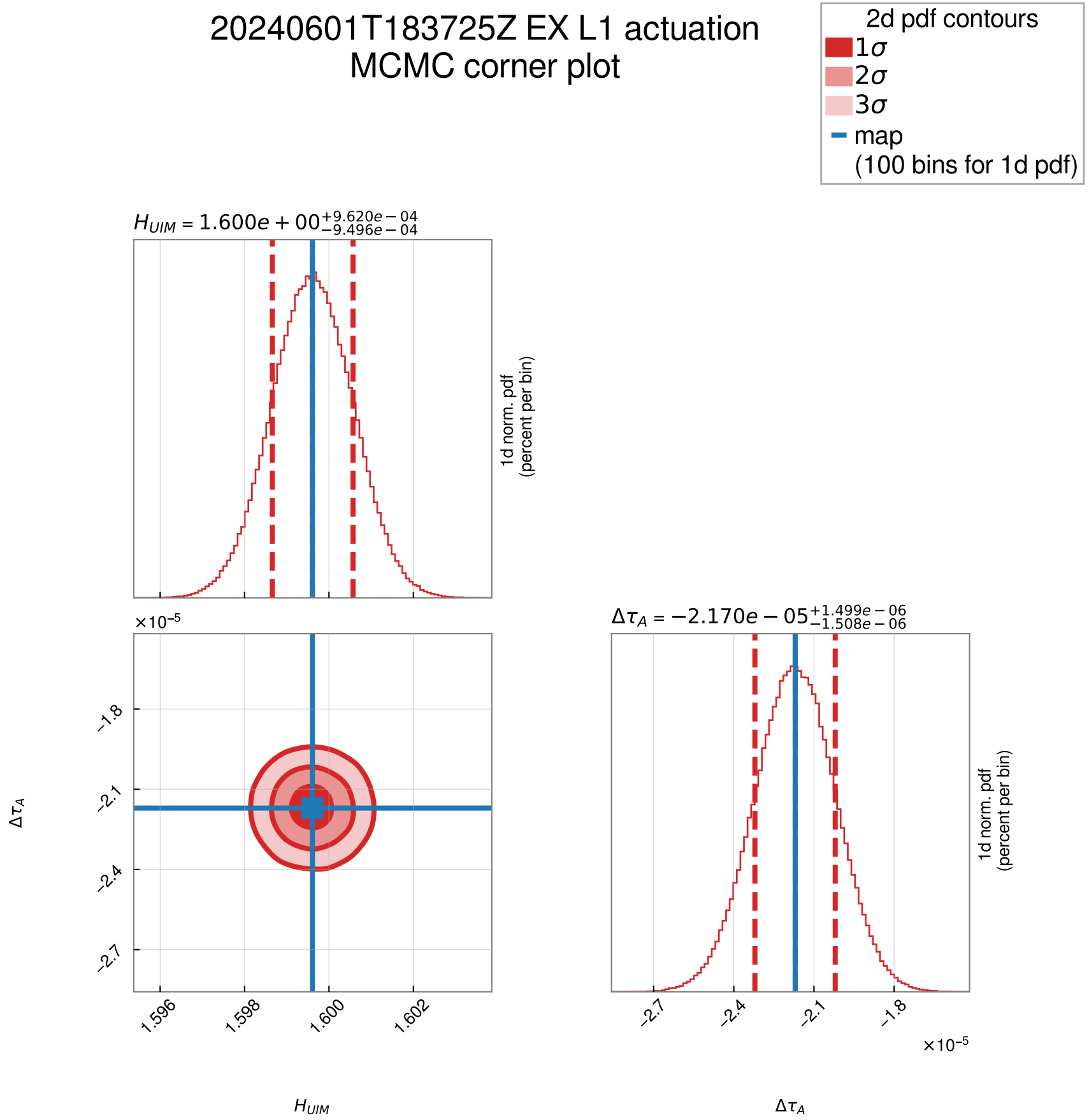


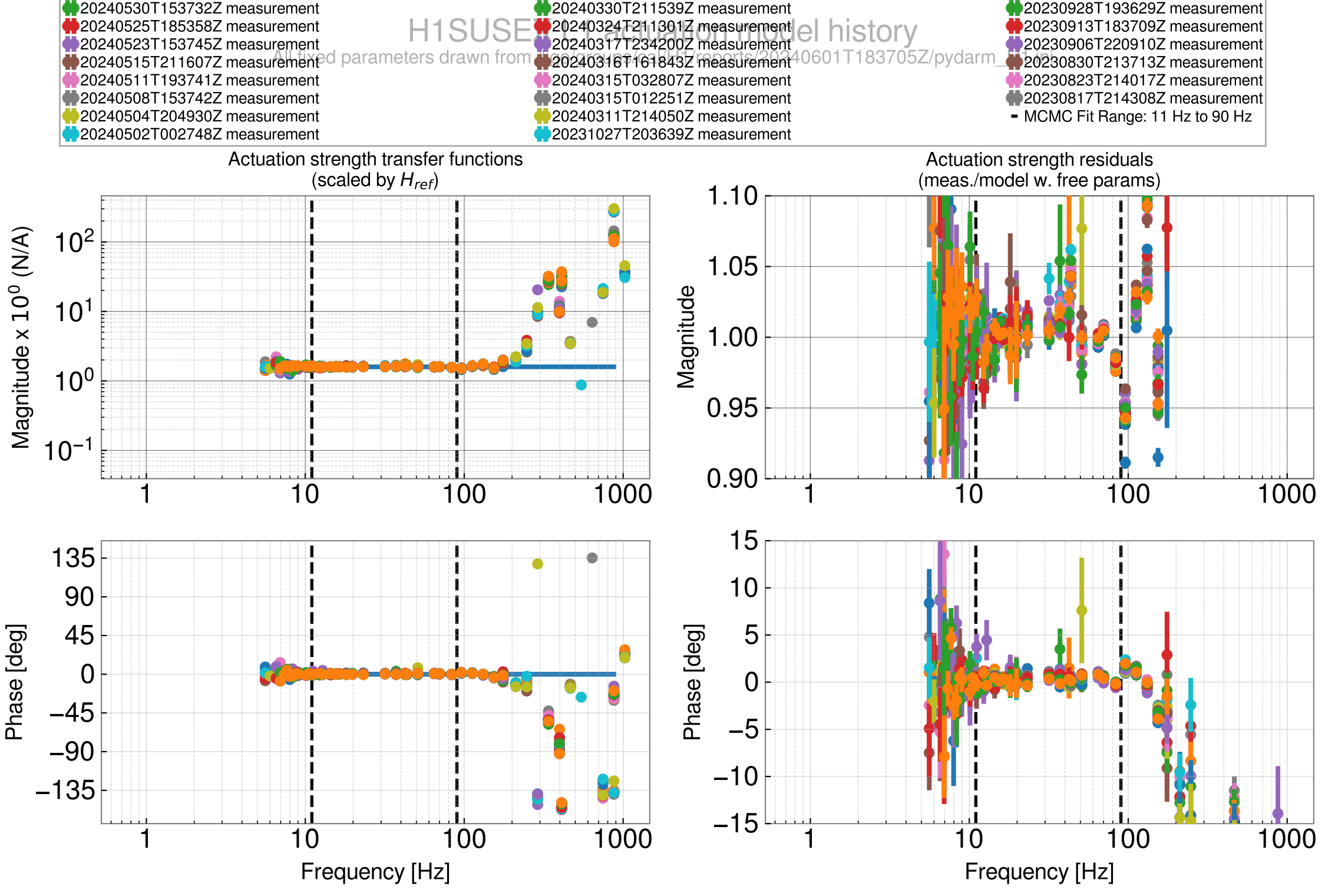




Parameter (value +/-)	value	+	-
Actuation Gain, Hau (N/A)	1.6	0.000962 (0.06%)	0.0009496 (0.06%)
Residual time delay, tau_A (s)	-2.17e-05	1.499e-06 (-6.91%)	1.508e-06 (-6.95%)

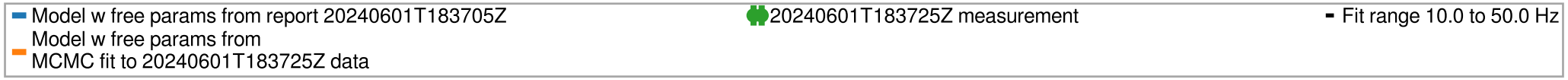
20240601T183725Z EX L1 actuation
MCMC corner plot

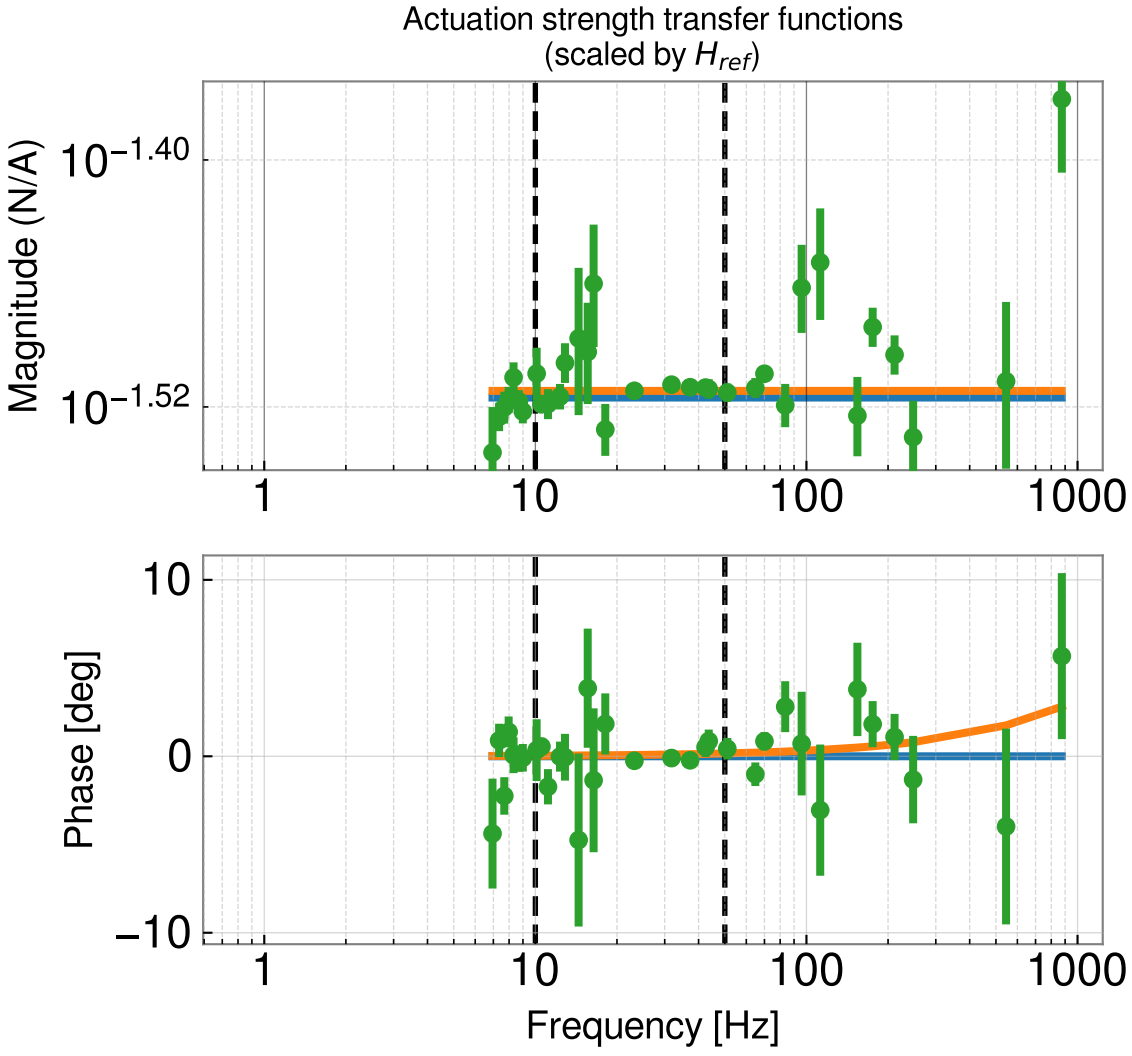


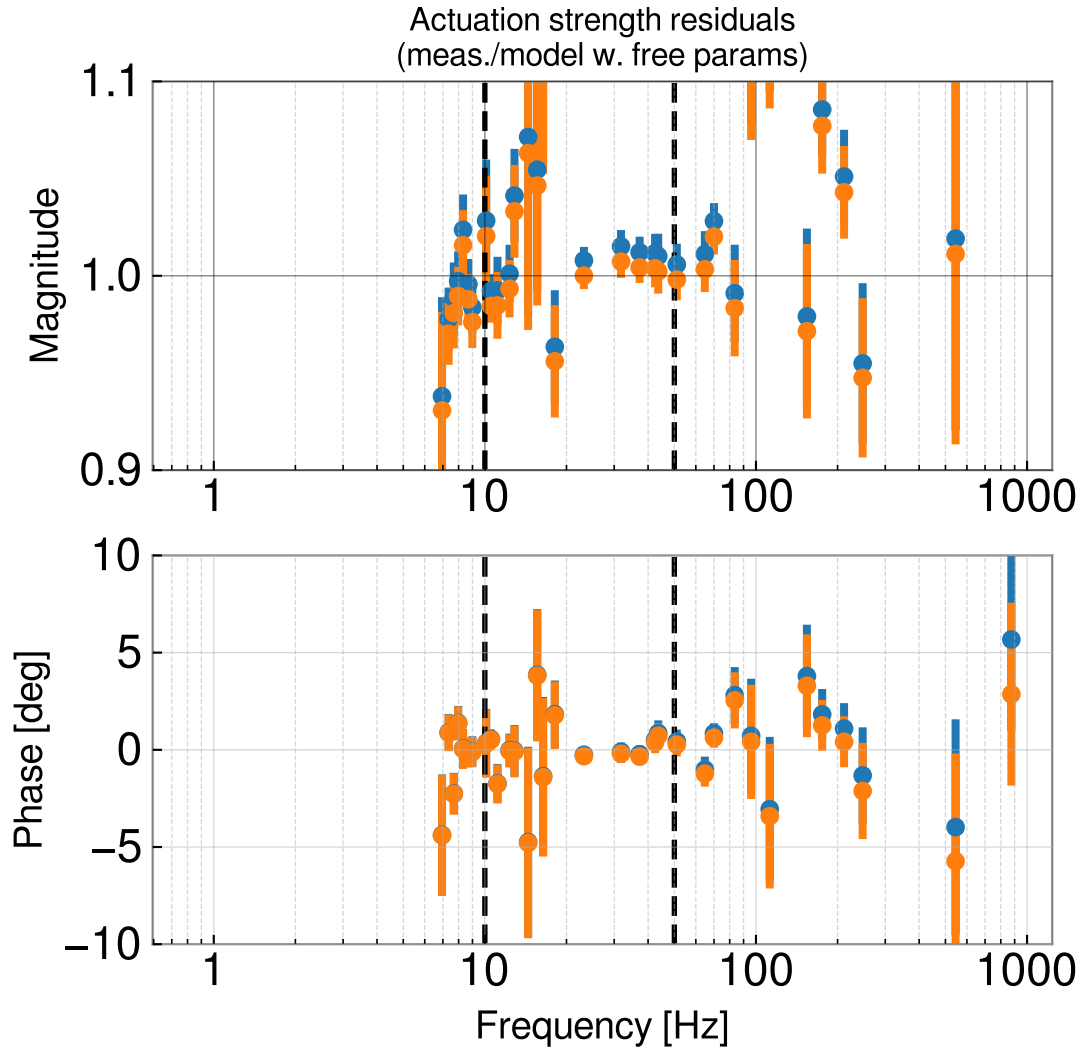

H1SUSETMX L1 actuation model history
All fixed parameters drawn from /ligo/groups/cal/H1/reports/20240601T183705Z/pydarm_H1.ini
20240530T153732Z measurement
20240525T185358Z measurement
20240523T153745Z measurement
20240515T211607Z measurement
20240511T193741Z measurement
20240508T153742Z measurement
20240504T204930Z measurement
20240502T002748Z measurement
20240330T211539Z measurement
20240324T211301Z measurement
20240317T234200Z measurement
20240316T161843Z measurement
20240315T032807Z measurement
20240315T012251Z measurement
20240311T214050Z measurement
20231027T203639Z measurement
20230928T193629Z measurement
20230913T183709Z measurement
20230906T220910Z measurement
20230830T213713Z measurement
20230823T214017Z measurement
20230817T214308Z measurement
MCMC Fit Range: 11 Hz to 90 Hz
Actuation strength transfer functions
(scaled by H_{ref})
Magnitude x 10^0 (N/A)
Actuation strength residuals
(meas./model w. free params)
Magnitude
Phase [deg]
Frequency [Hz]

H1SUSEX L2 actuation model MCMC summary

All fixed parameters drawn from /ligo/groups/cal/H1/reports/20240601T183705Z/pydarm_H1.ini

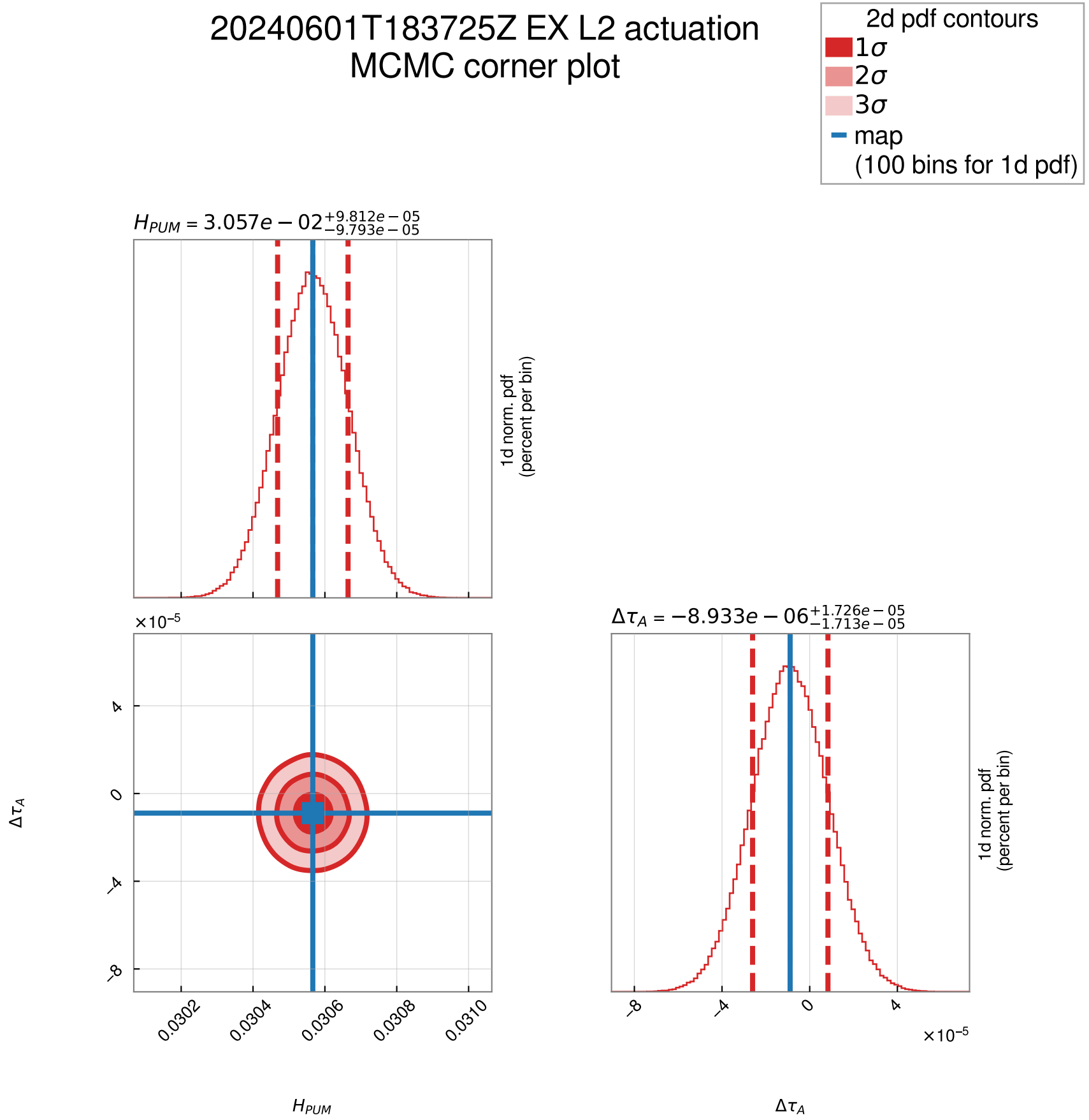


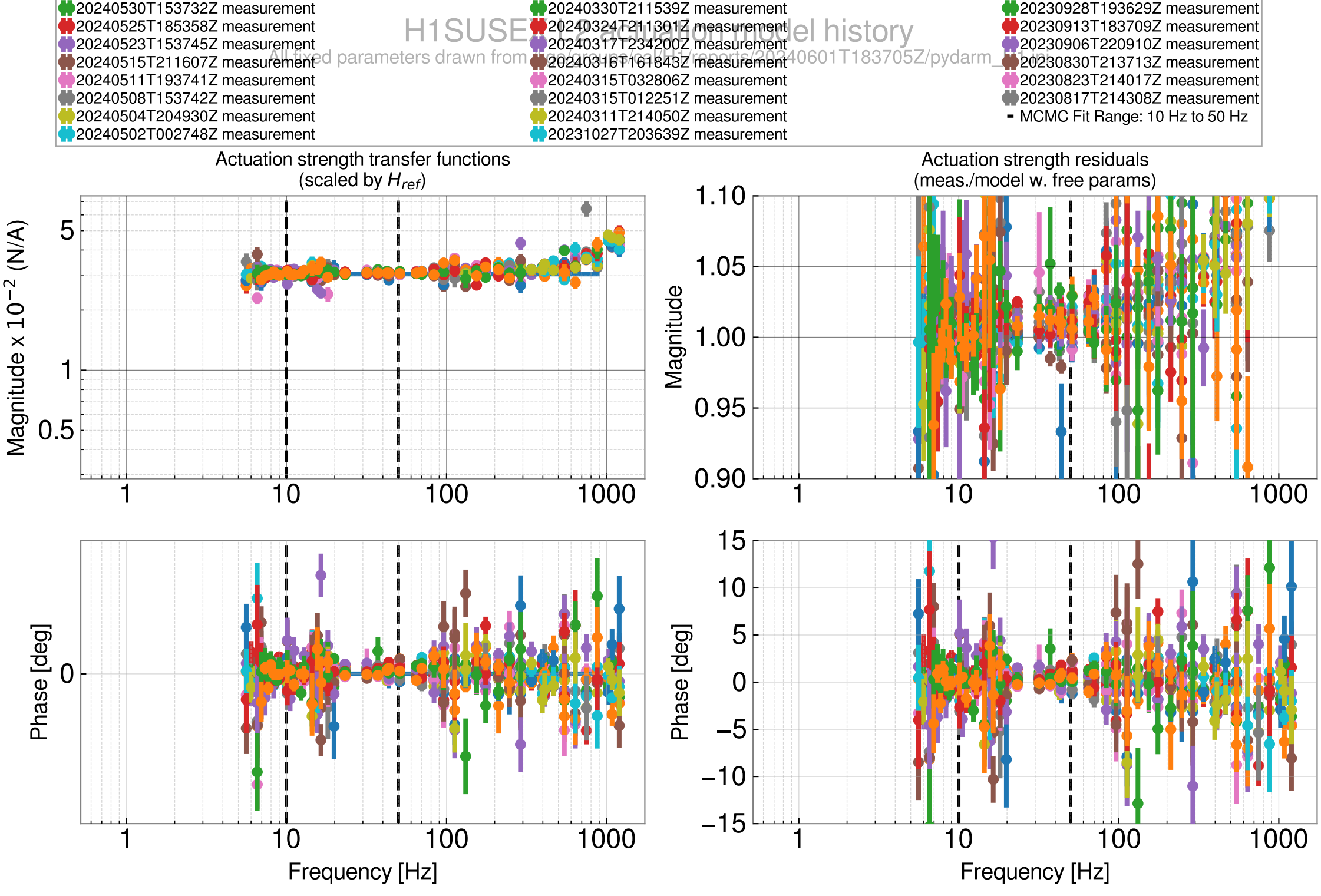




Parameter (value +/-)	value	+	-
Actuation Gain, Hap (N/A)	0.03057	9.812e-05 (0.32%)	9.793e-05 (0.32%)
Residual time delay, tau_A (s)	-8.933e-06	1.726e-05 (-193.17%)	1.713e-05 (-191.70%)

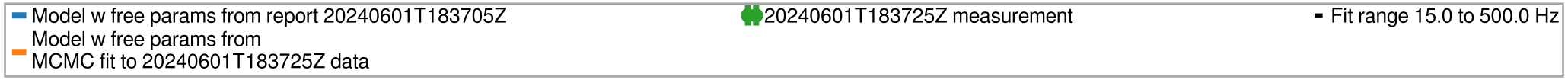
20240601T183725Z EX L2 actuation
MCMC corner plot

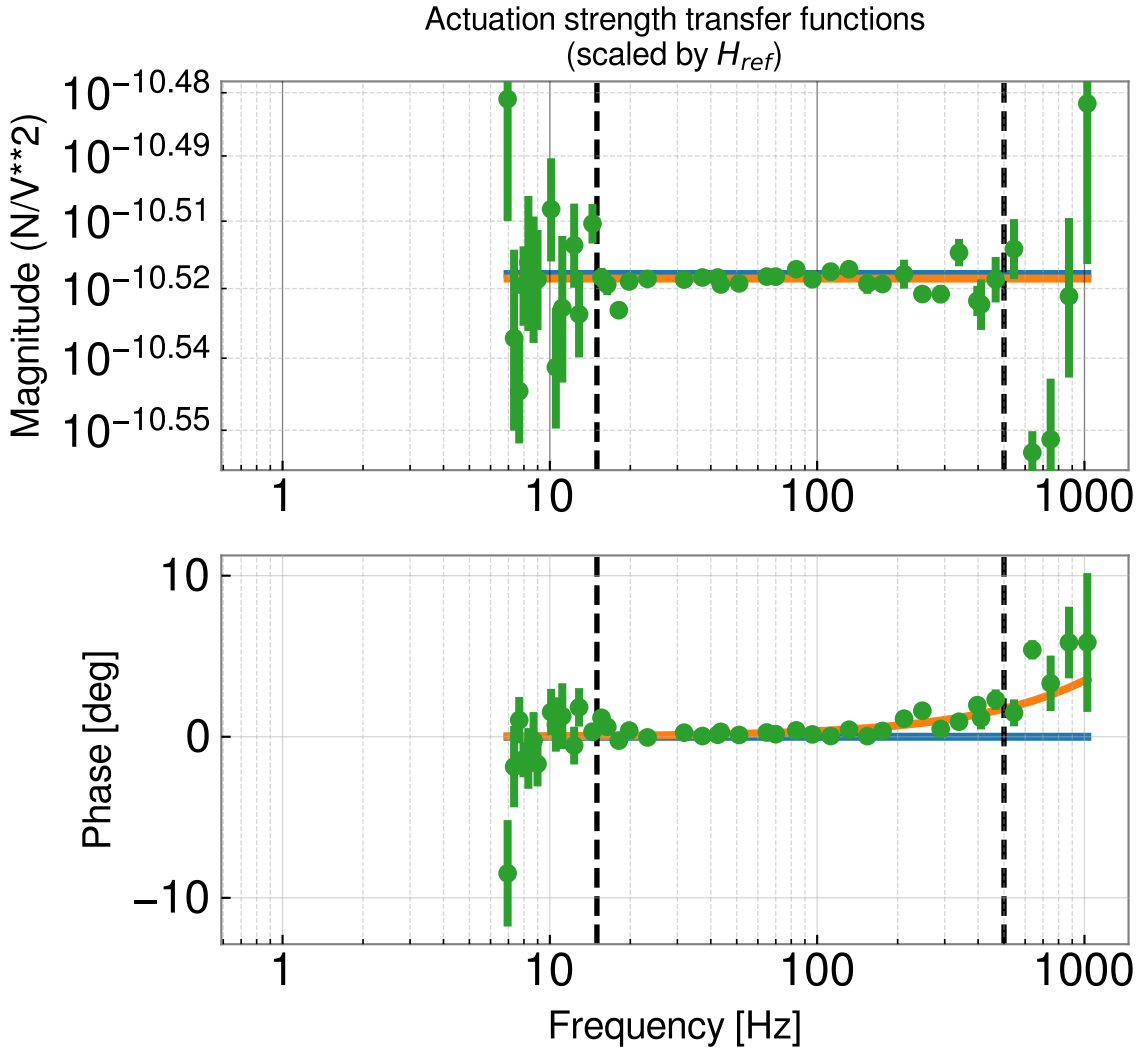


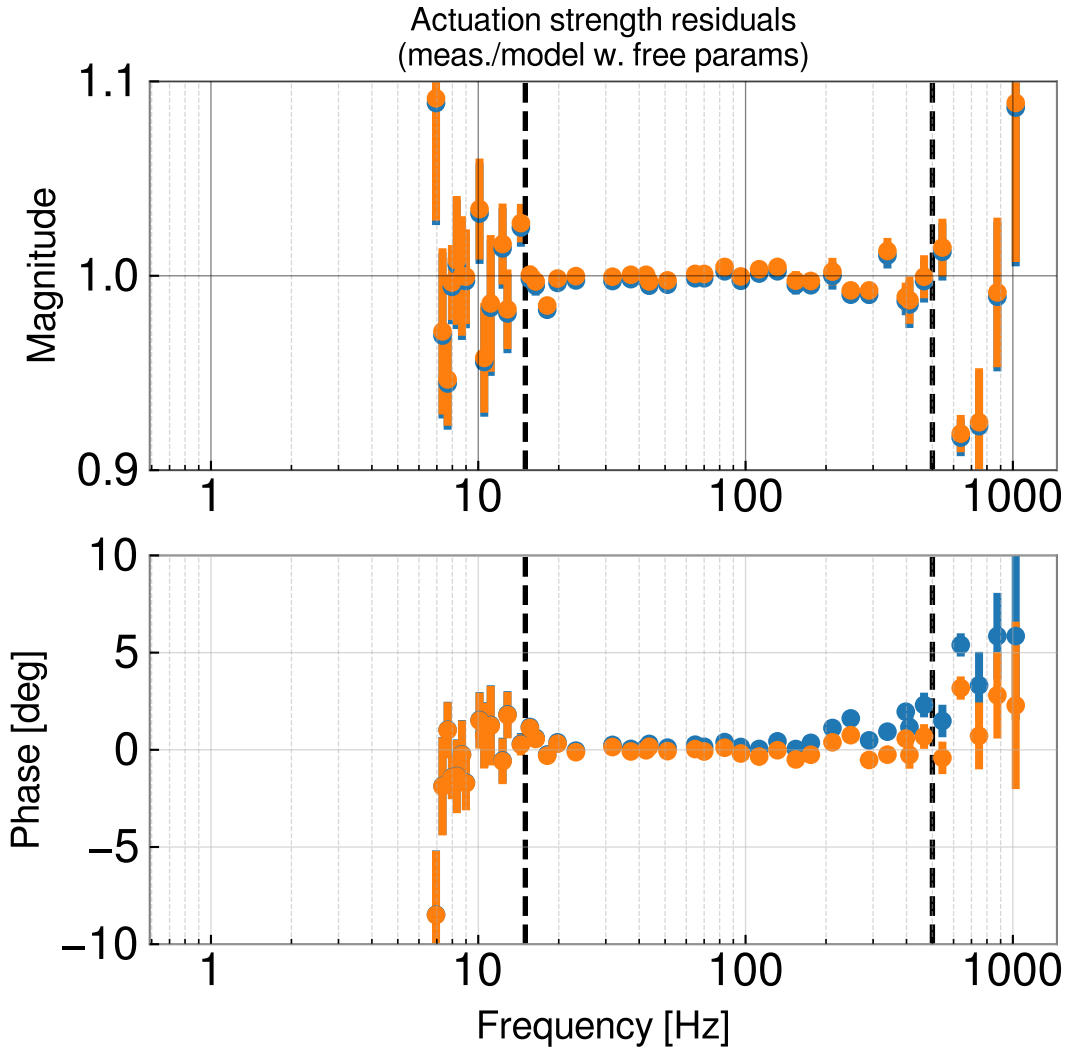

H1SUSETMX L2 actuation model history
All fixed parameters drawn from /ligo/groups/cal/H1/reports/20240601T183705Z/pydarm_H1.ini
20240530T153732Z measurement
20240525T185358Z measurement
20240523T153745Z measurement
20240515T211607Z measurement
20240511T193741Z measurement
20240508T153742Z measurement
20240504T204930Z measurement
20240502T002748Z measurement
20240330T211539Z measurement
20240324T211301Z measurement
20240317T234200Z measurement
20240316T161843Z measurement
20240315T032806Z measurement
20240315T012251Z measurement
20240311T214050Z measurement
20231027T203639Z measurement
20230928T193629Z measurement
20230913T183709Z measurement
20230906T220910Z measurement
20230830T213713Z measurement
20230823T214017Z measurement
20230817T214308Z measurement
MCMC Fit Range: 10 Hz to 50 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]

H1SUSEX L3 actuation model MCMC summary

All fixed parameters drawn from /ligo/groups/cal/H1/reports/20240601T183705Z/pydarm_H1.ini

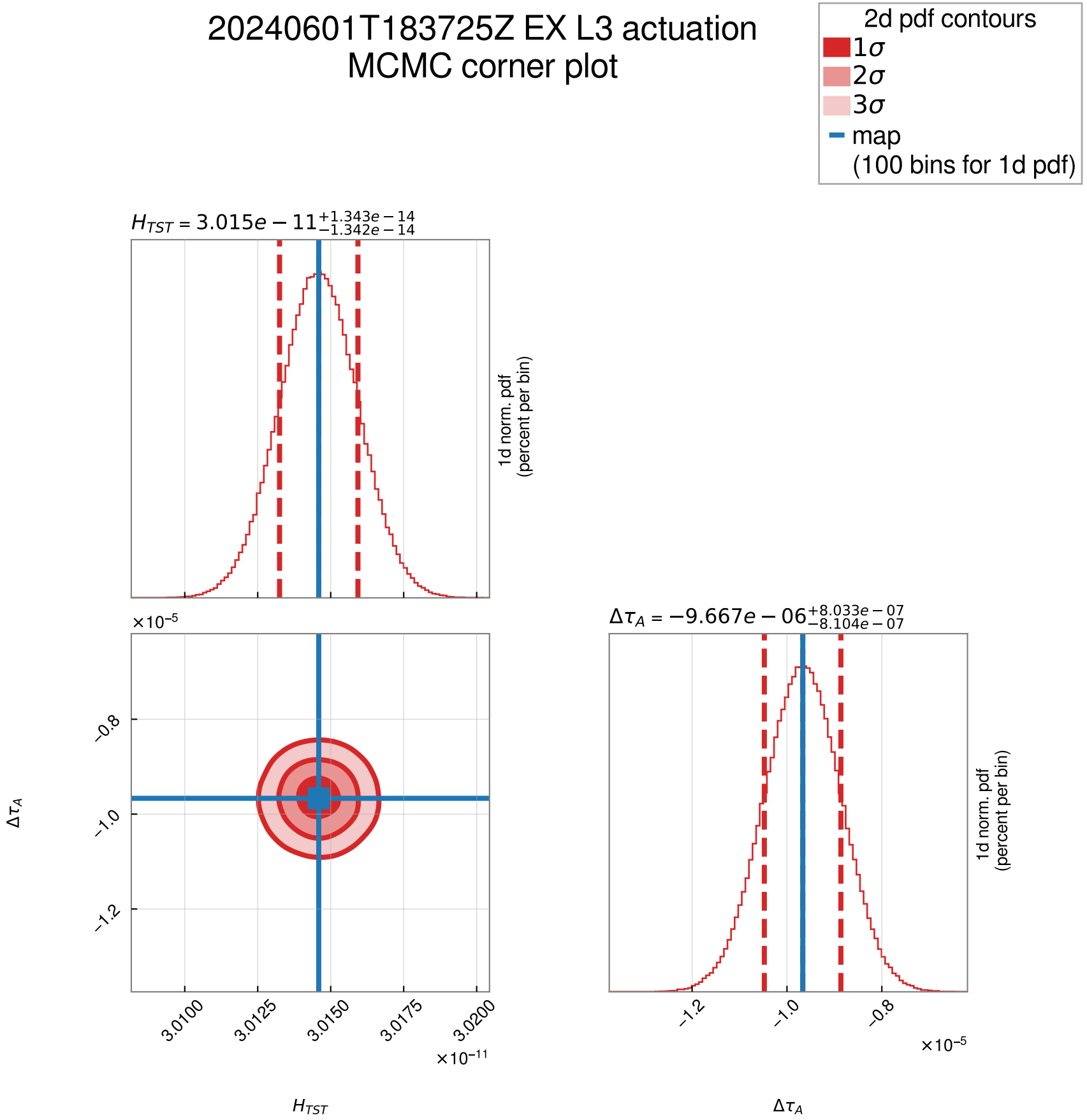


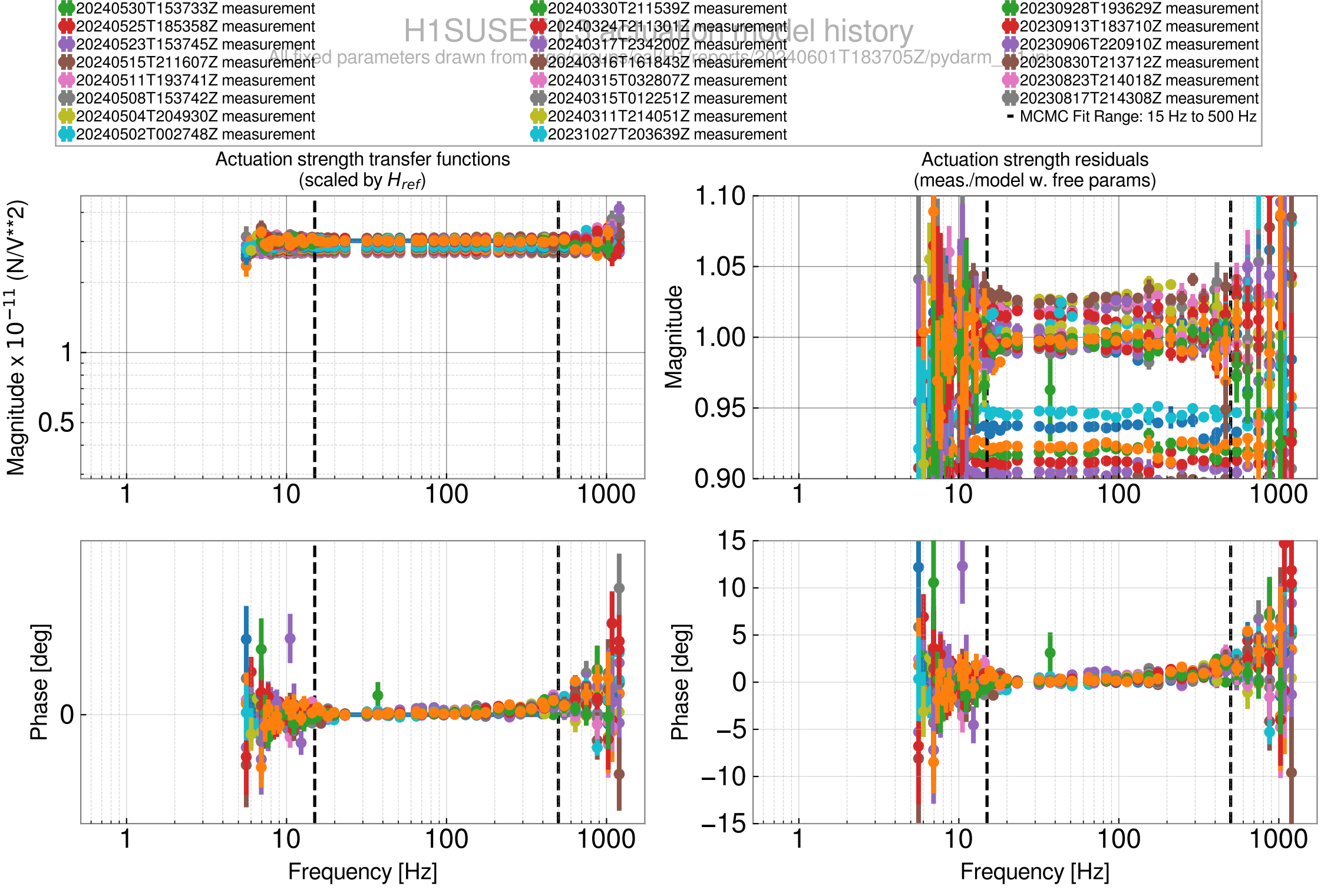


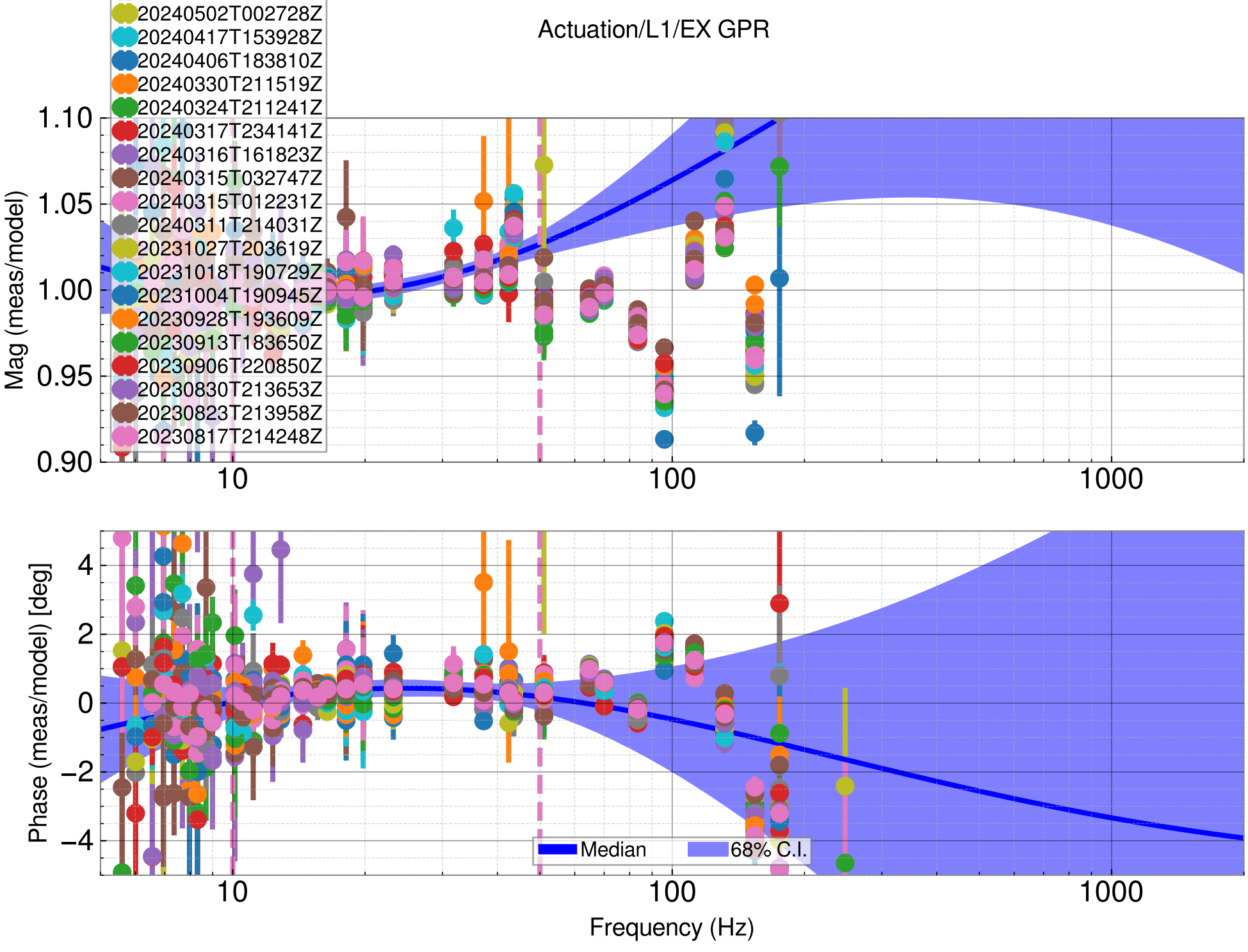


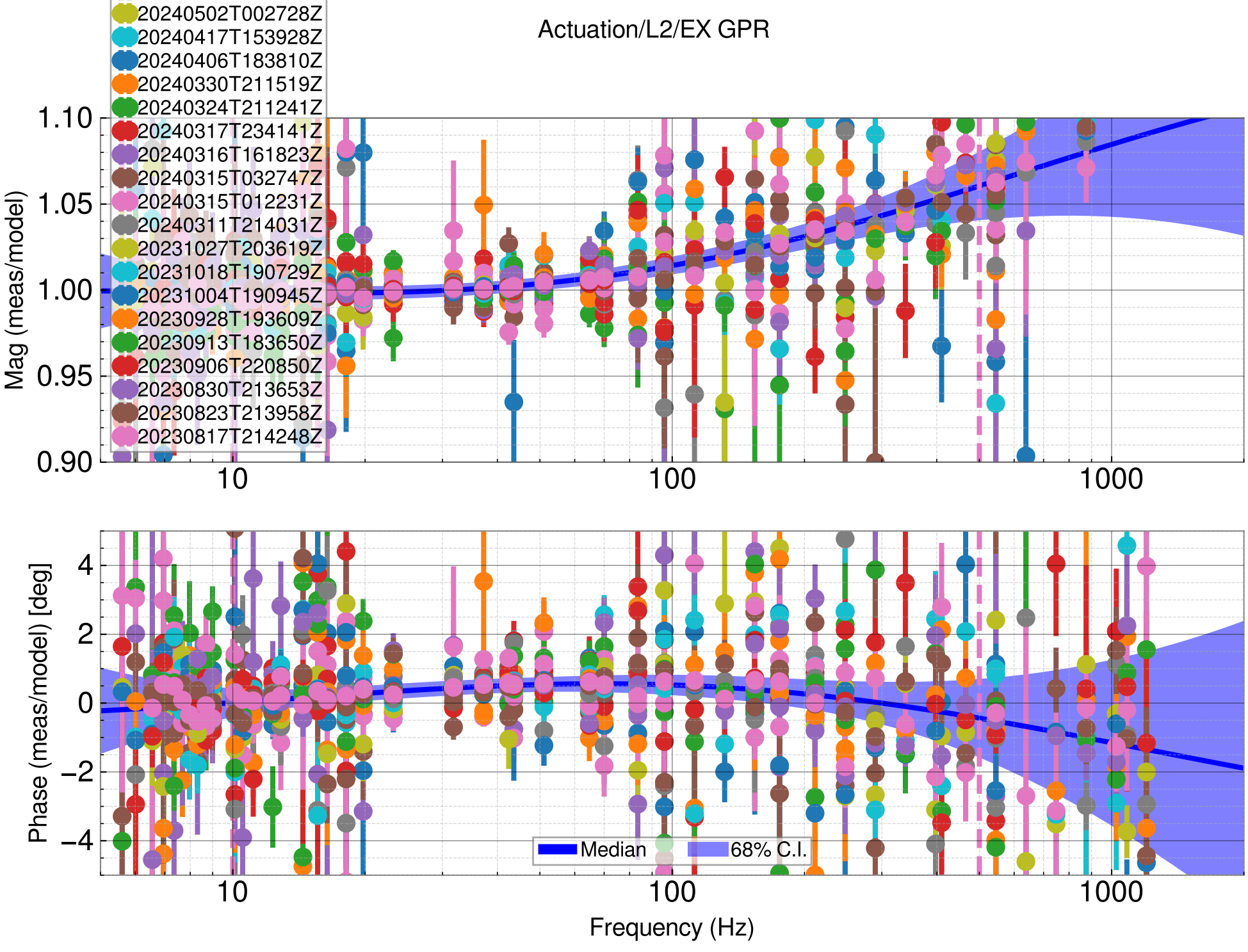
Parameter (value +/-)	value	+	-
Actuation Gain, Hat (N/V**2)	3.015e-11	1.343e-14 (0.04%)	1.342e-14 (0.04%)
Residual time delay, tau_A (s)	-9.667e-06	8.033e-07 (-8.31%)	8.104e-07 (-8.38%)

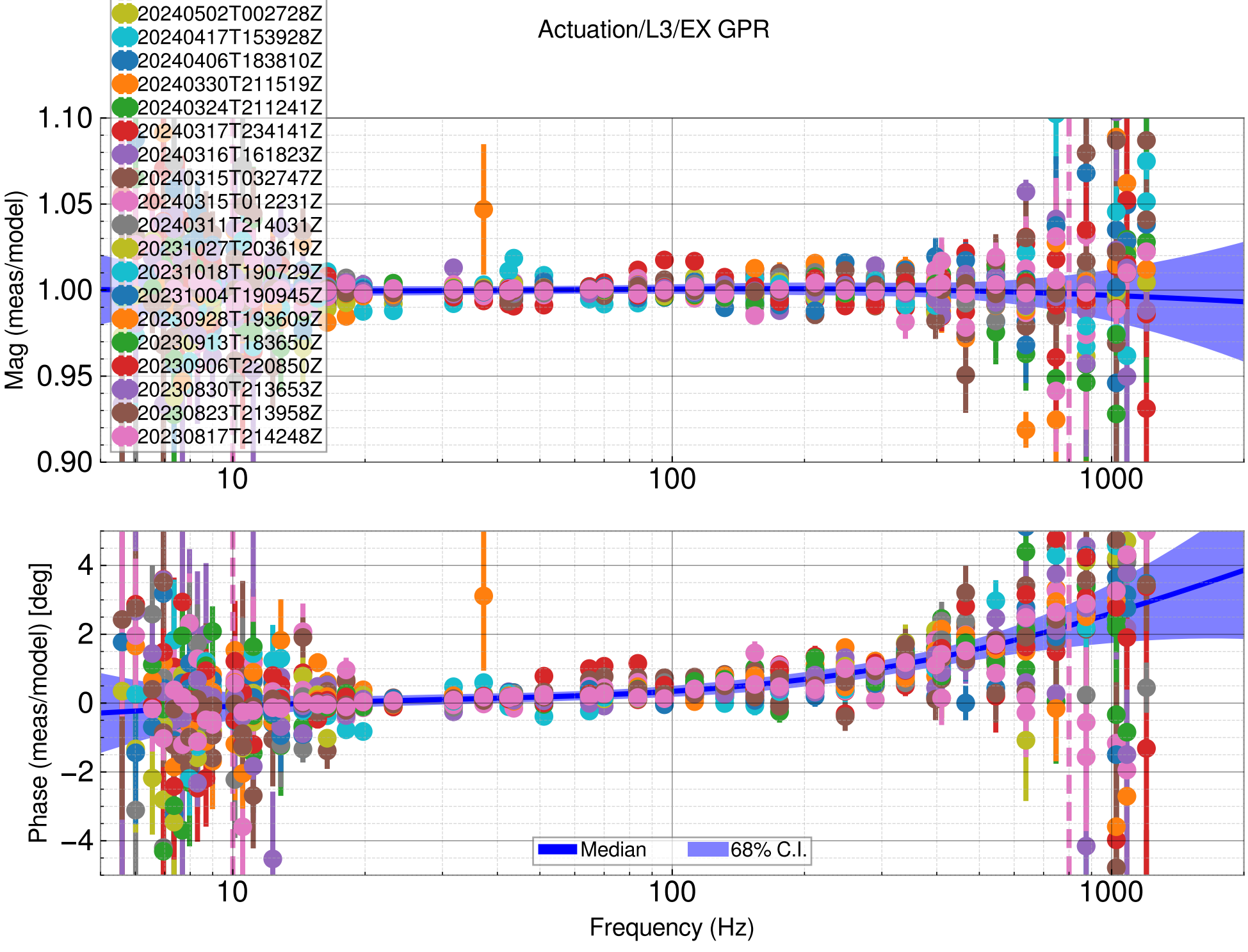
20240601T183725Z EX L3 actuation
MCMC corner plot

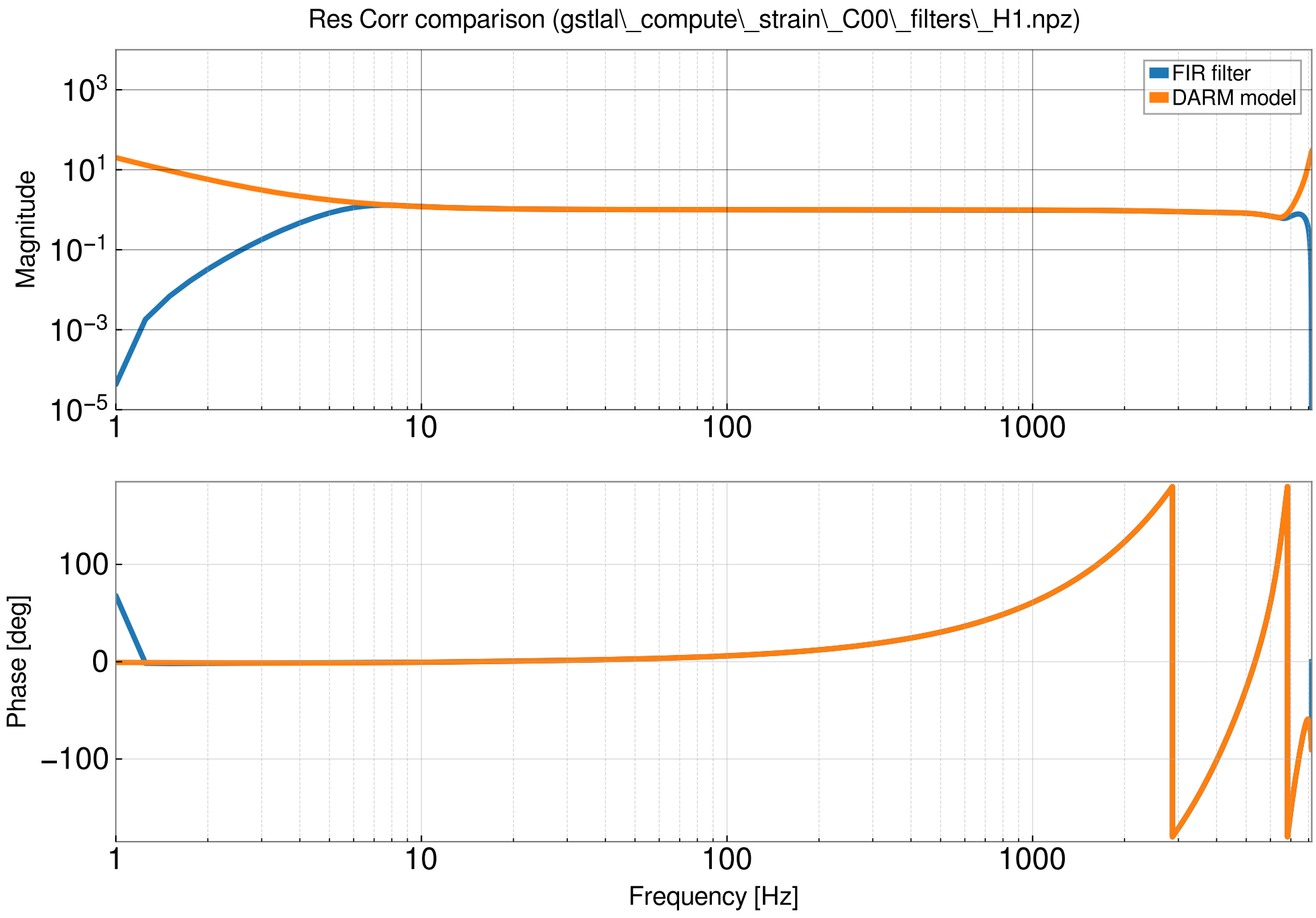


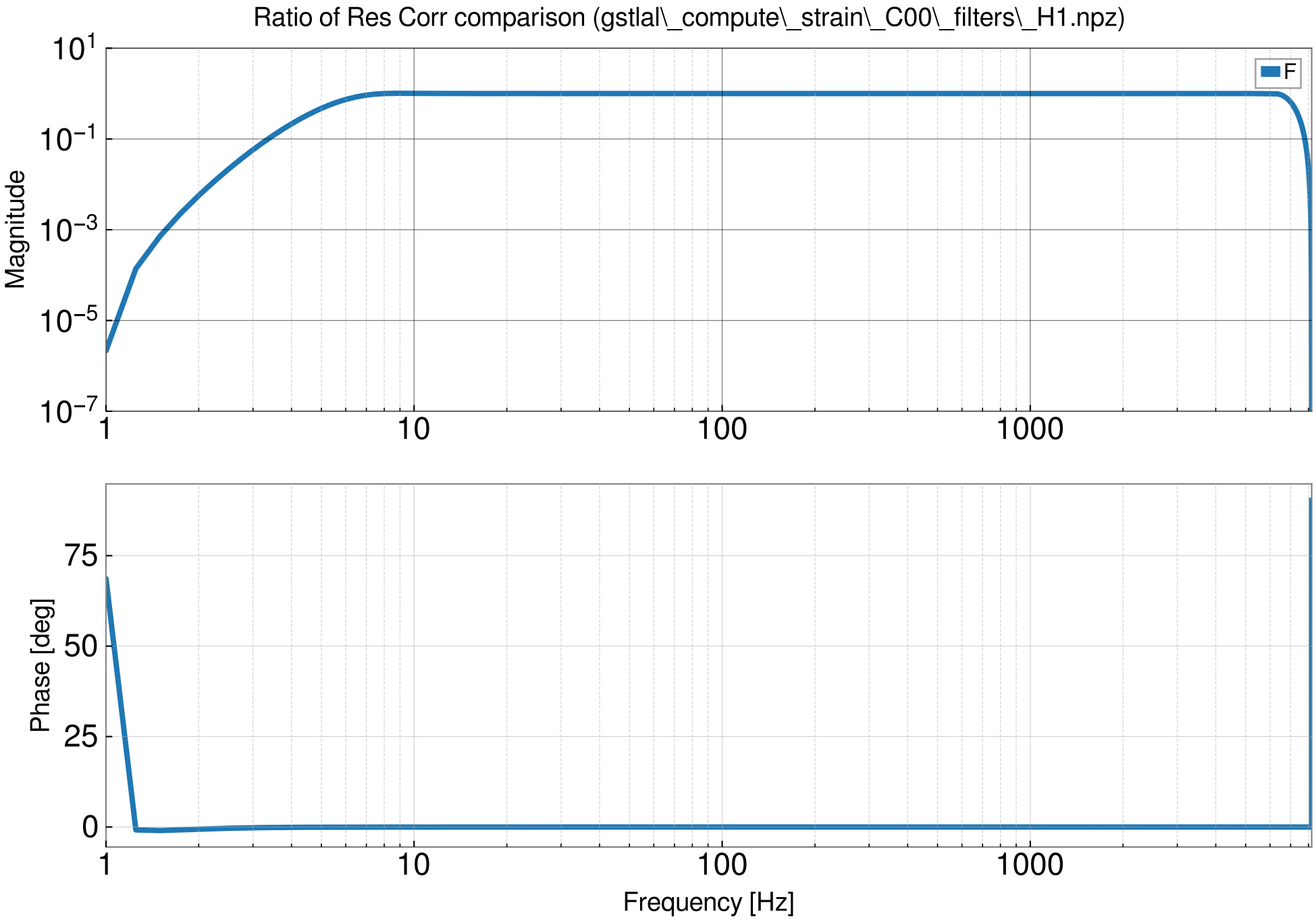

20240530T153733Z measurement
20240525T185358Z measurement
20240523T153745Z measurement
20240515T211607Z measurement
20240511T193741Z measurement
20240508T153742Z measurement
20240504T204930Z measurement
20240502T002748Z measurement
20240330T211539Z measurement
20240324T211301Z measurement
20240317T234200Z measurement
20240316T161843Z measurement
20240315T032807Z measurement
20240315T012251Z measurement
20240311T214051Z measurement
20231027T203639Z measurement
20230928T193629Z measurement
20230913T183710Z measurement
20230906T220910Z measurement
20230830T213712Z measurement
20230823T214018Z measurement
20230817T214308Z measurement
MCMC Fit Range: 15 Hz to 500 Hz
H1SUSETMY actuation model history
All fixed parameters drawn from /ligo/groups/cal/H1/reports/20240601T183705Z/pydarm_H1.ini
Actuation strength transfer functions
(scaled by H_{ref})
Magnitude x 10^{-11} (N/V**2)
1
0.5
1
10
100
1000
Actuation strength residuals
(meas./model w. free params)
Magnitude
1.10
1.05
1.00
0.95
0.90
1
10
100
1000
Phase [deg]
0
1
10
100
1000
Frequency [Hz]
Phase [deg]
15
10
5
0
−5
−10
−15
1
10
100
1000
Frequency [Hz]

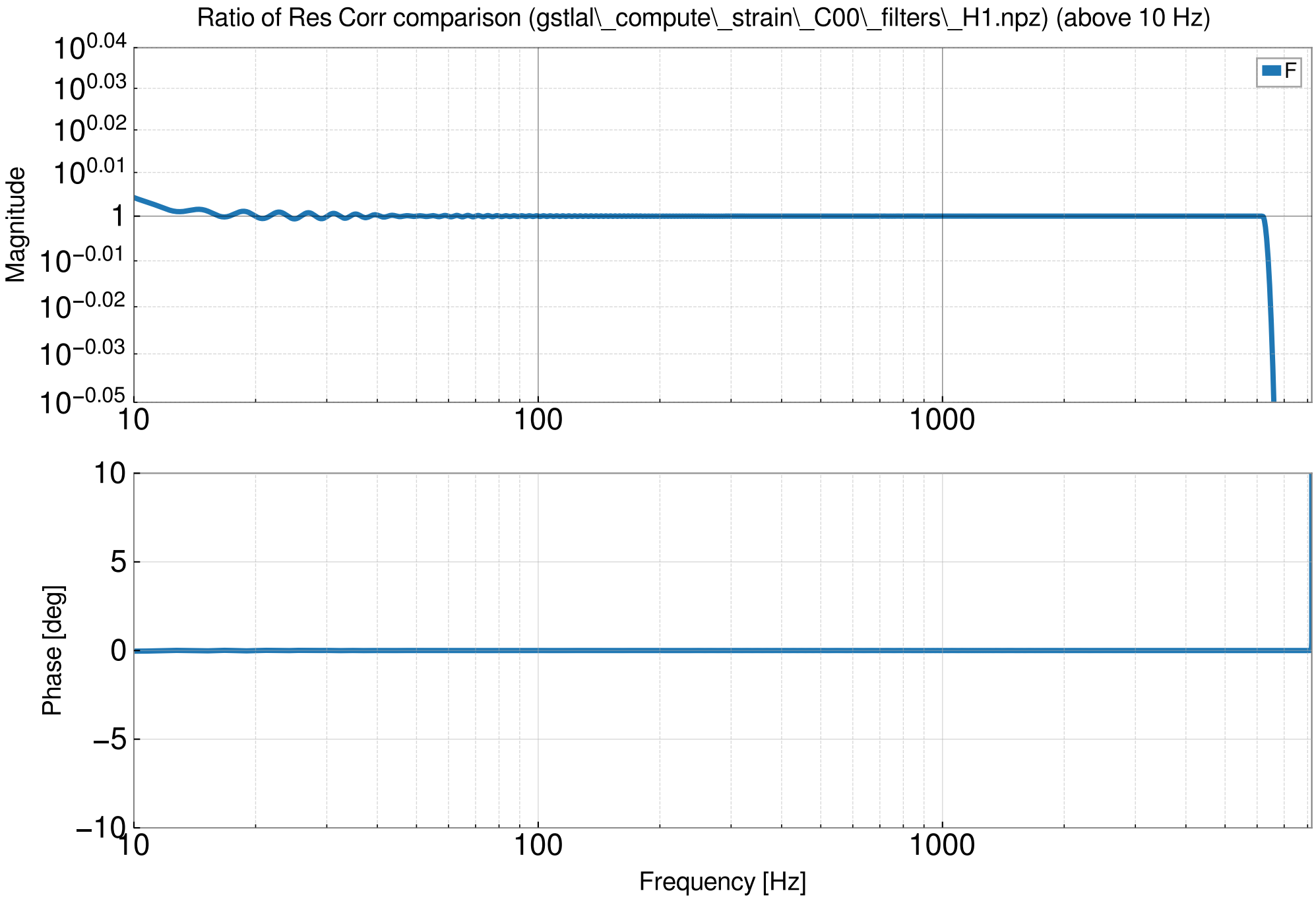

Actuation/L1/EX GPR
20240502T002728Z
20240417T153928Z
20240406T183810Z
20240330T211519Z
20240324T211241Z
20240317T234141Z
20240316T161823Z
20240315T032747Z
20240315T012231Z
20240311T214031Z
20231027T203619Z
20231018T190729Z
20231004T190945Z
20230928T193609Z
20230913T183650Z
20230906T220850Z
20230830T213653Z
20230823T213958Z
20230817T214248Z
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)

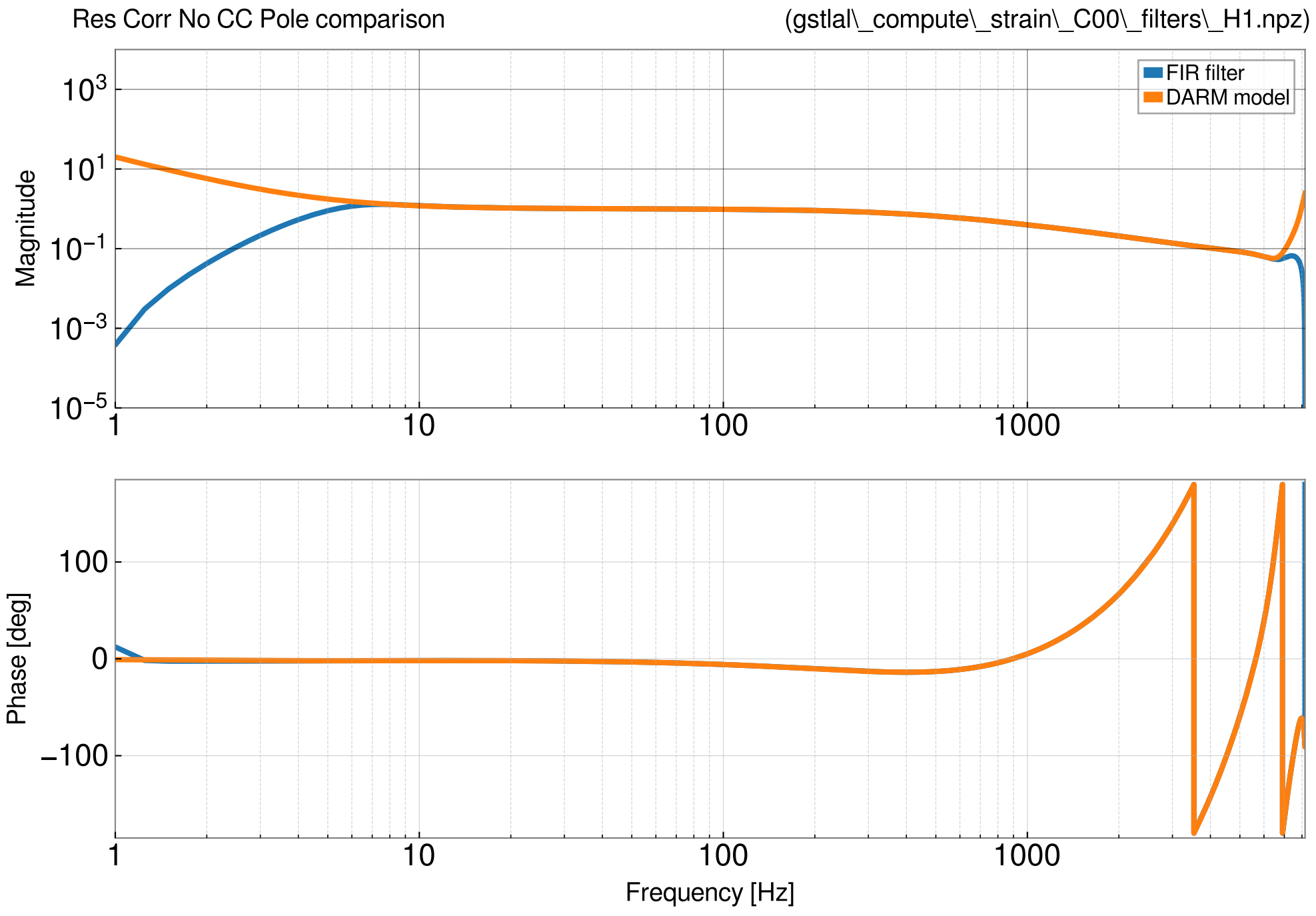

Actuation/L2/EX GPR
20240502T002728Z
20240417T153928Z
20240406T183810Z
20240330T211519Z
20240324T211241Z
20240317T234141Z
20240316T161823Z
20240315T032747Z
20240315T012231Z
20240311T214031Z
20231027T203619Z
20231018T190729Z
20231004T190945Z
20230928T193609Z
20230913T183650Z
20230906T220850Z
20230830T213653Z
20230823T213958Z
20230817T214248Z
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)

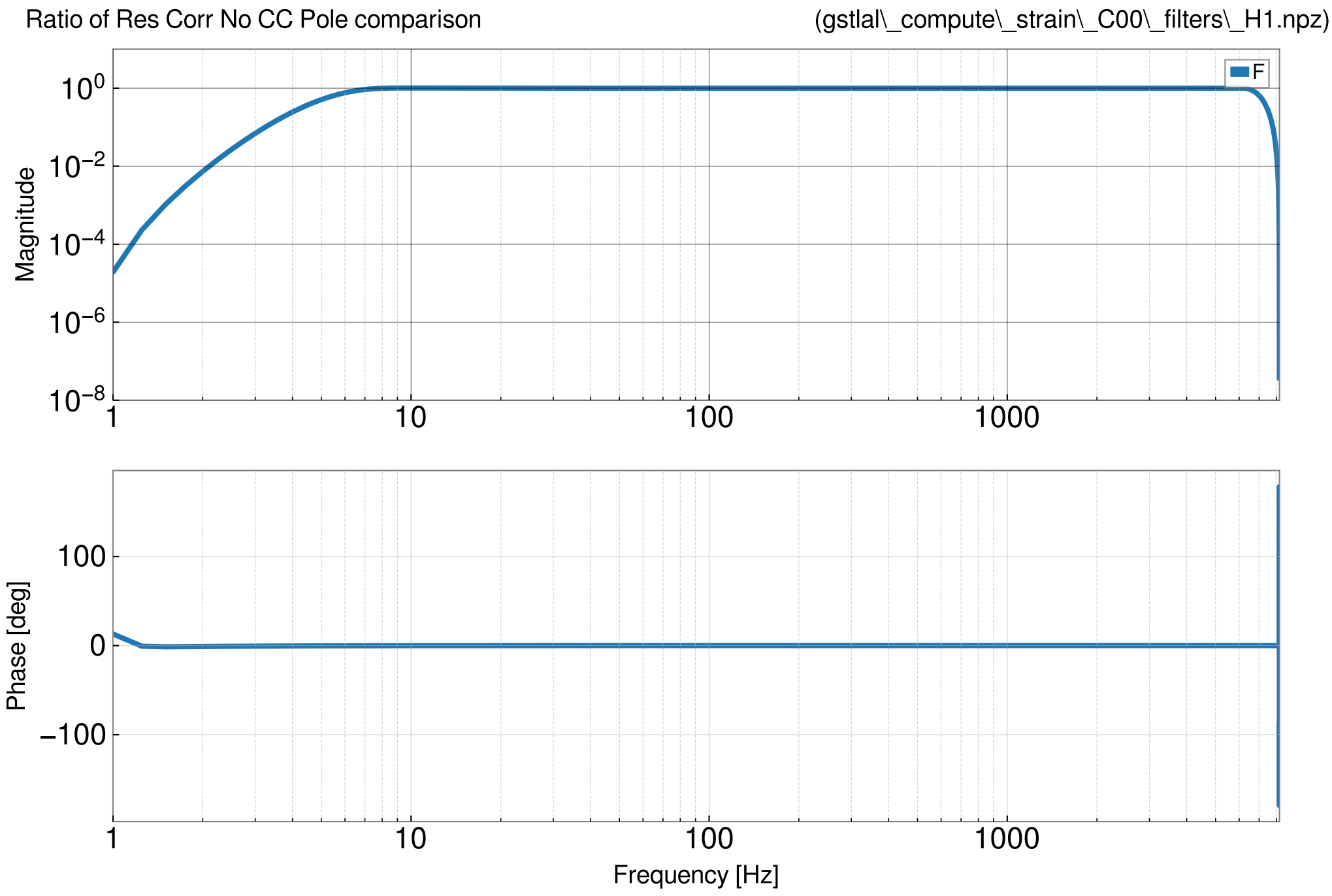

Actuation/L3/EX GPR
20240502T002728Z
20240417T153928Z
20240406T183810Z
20240330T211519Z
20240324T211241Z
20240317T234141Z
20240316T161823Z
20240315T032747Z
20240315T012231Z
20240311T214031Z
20231027T203619Z
20231018T190729Z
20231004T190945Z
20230928T193609Z
20230913T183650Z
20230906T220850Z
20230830T213653Z
20230823T213958Z
20230817T214248Z
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)

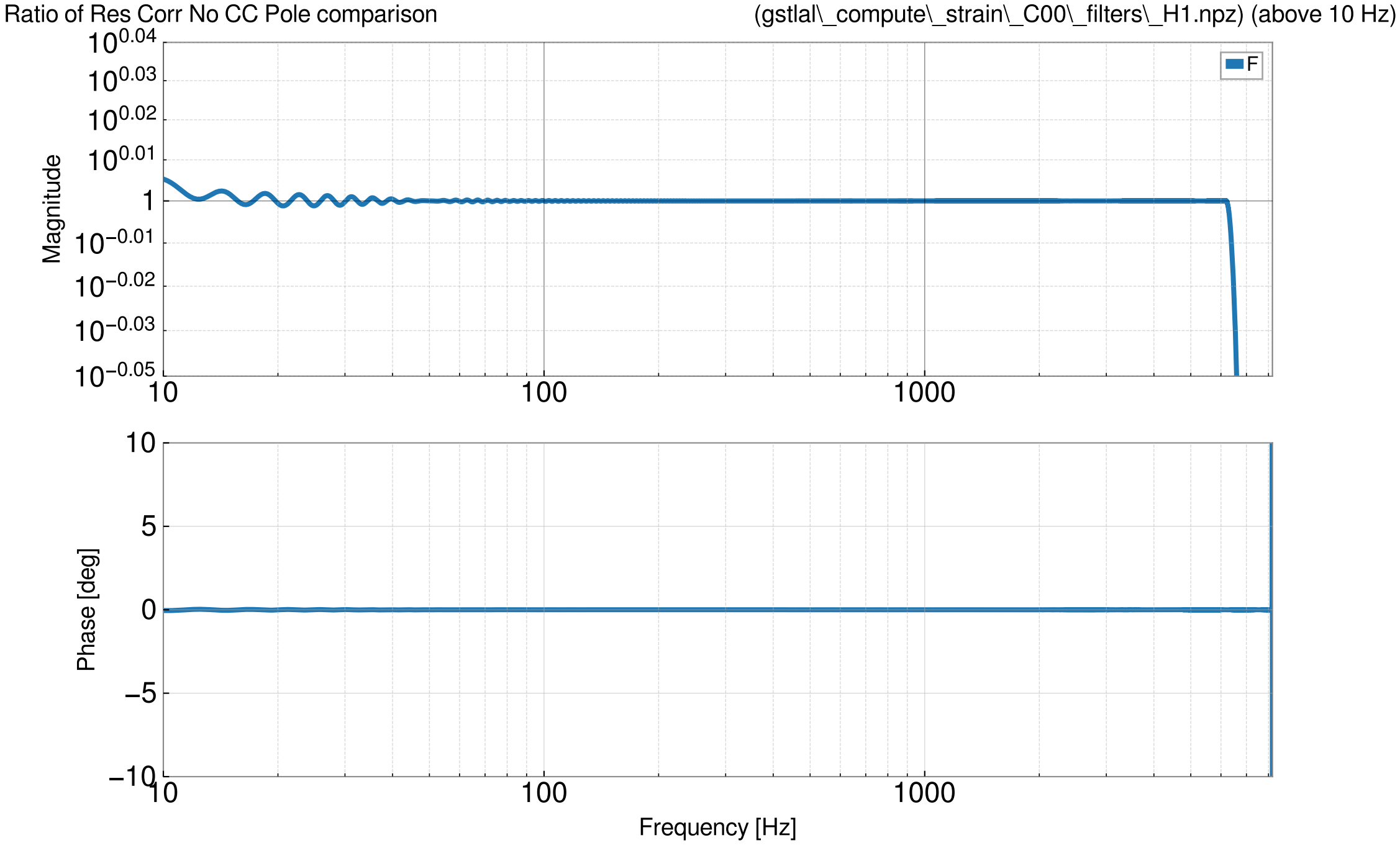

Res Corr comparison (gstlal_compute_strain_C00_filters_H1.npz)
FIR filter
DARM model
Magnitude
10^{3}
10^{1}
10^{-1}
10^{-3}
10^{-5}
1
10
100
1000
Phase [deg]
100
0
−100
1
10
100
1000
Frequency [Hz]

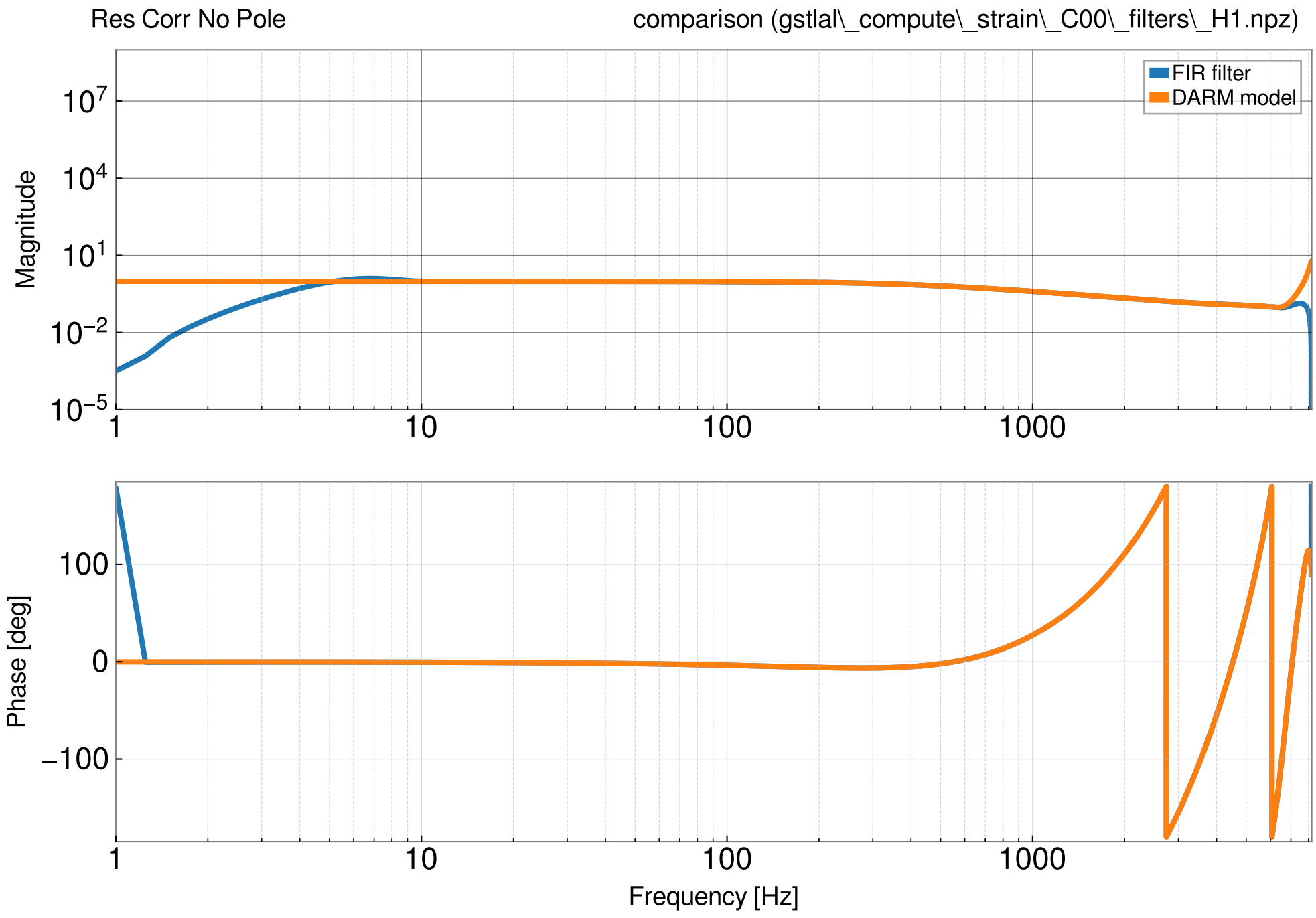

Ratio of Res Corr comparison (gstlal_compute_strain_C00_filters_H1.npz)
Magnitude
10^{1}
10^{-1}
10^{-3}
10^{-5}
10^{-7}
F
1
10
100
1000
Phase [deg]
75
50
25
0
1
10
100
1000
Frequency [Hz]

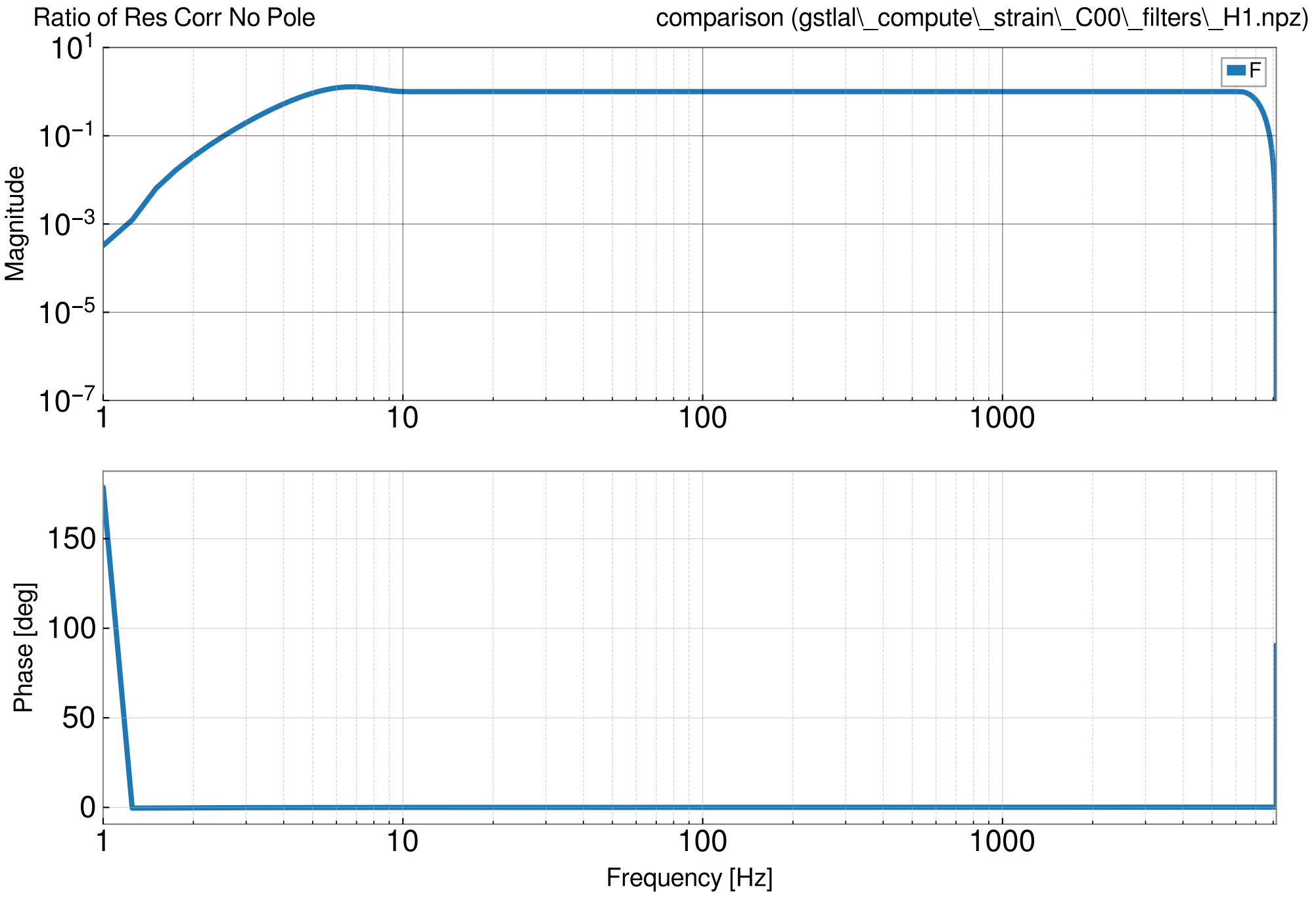

Ratio of Res Corr comparison (gstlal_compute_strain_C00_filters_H1.npz) (above 10 Hz)
F
Magnitude
$10^{0.04}$
$10^{0.03}$
$10^{0.02}$
$10^{0.01}$
1
$10^{-0.01}$
$10^{-0.02}$
$10^{-0.03}$
$10^{-0.05}$
10
100
1000
Phase [deg]
10
5
0
−5
−10
10
100
1000
Frequency [Hz]

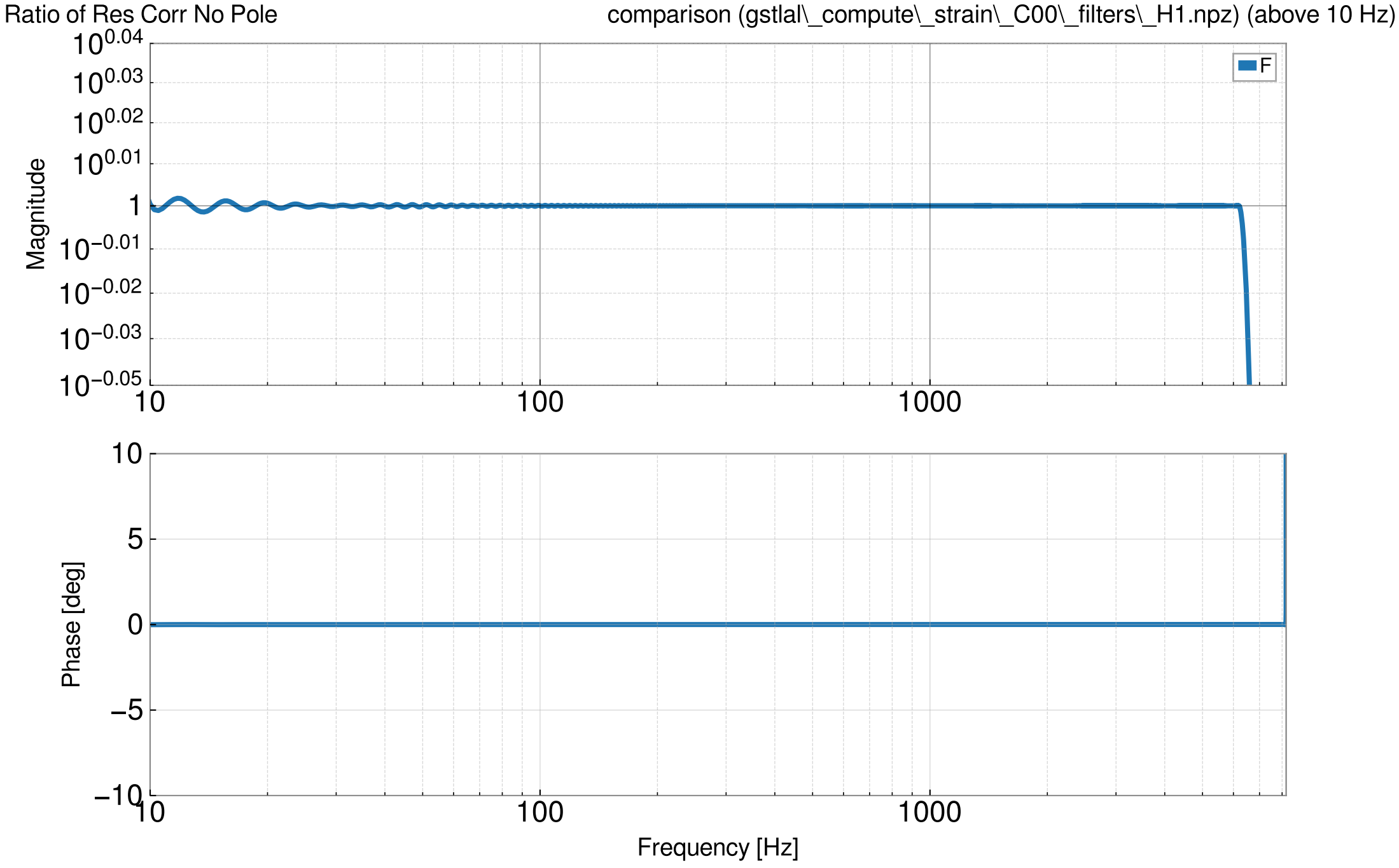

Res Corr No CC Pole comparison
(gstlal_compute_strain_C00_filters_H1.npz)
FIR filter
DARM model
Magnitude
10^3
10^1
10^{-1}
10^{-3}
10^{-5}
1
10
100
1000
Phase [deg]
100
0
−100
1
10
100
1000
Frequency [Hz]

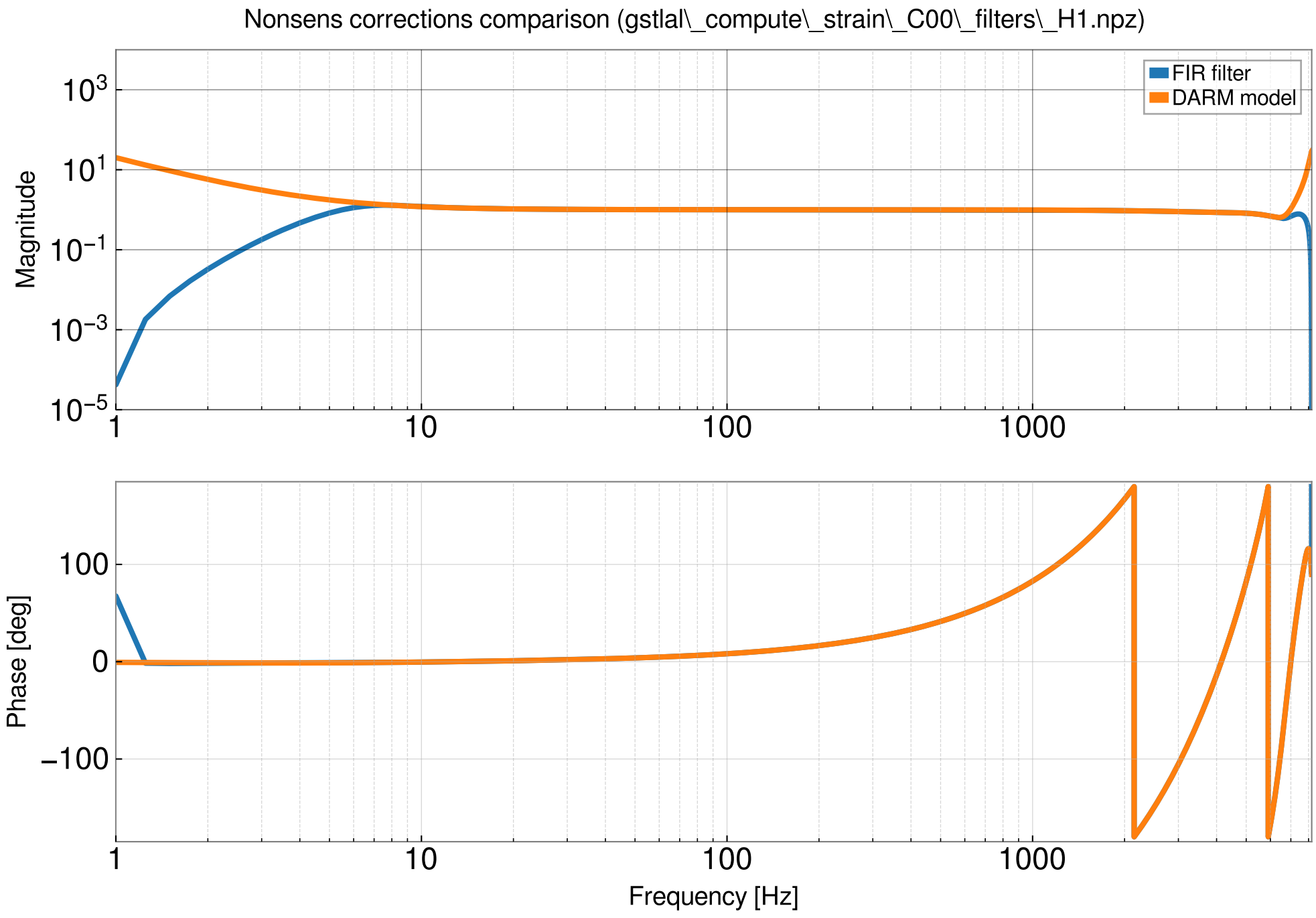

Ratio of Res Corr No CC Pole comparison
(gstlal_compute_strain_C00_filters_H1.npz)
F
Magnitude
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
1
10
100
1000
Phase [deg]
100
0
−100
1
10
100
1000
Frequency [Hz]

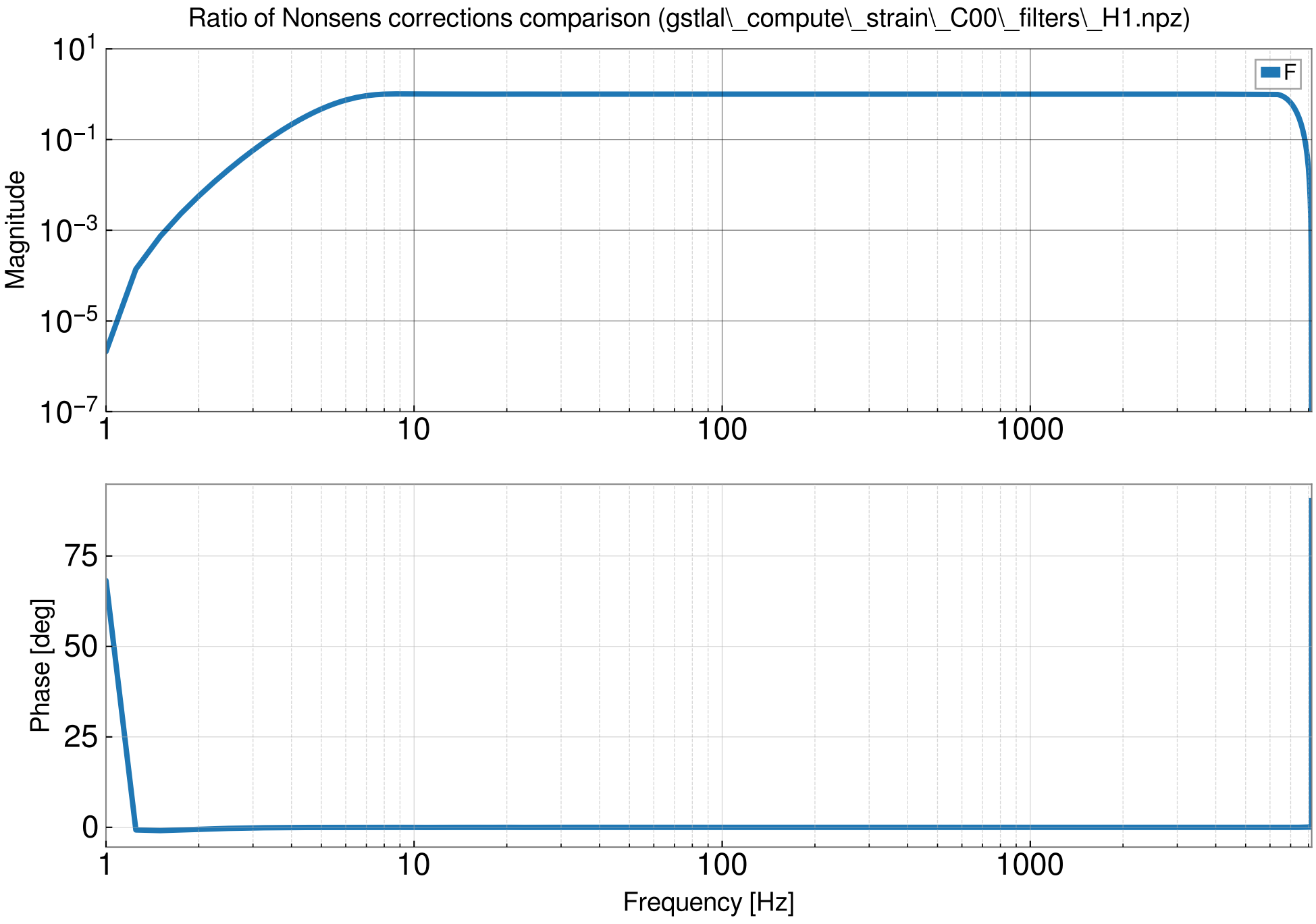

Ratio of Res Corr No CC Pole comparison
(gstlal_compute_strain_C00_filters_H1.npz) (above 10 Hz)
F
Magnitude
$10^{0.04}$
$10^{0.03}$
$10^{0.02}$
$10^{0.01}$
1
$10^{-0.01}$
$10^{-0.02}$
$10^{-0.03}$
$10^{-0.05}$
10
100
1000
Phase [deg]
10
5
0
−5
−10
10
100
1000
Frequency [Hz]

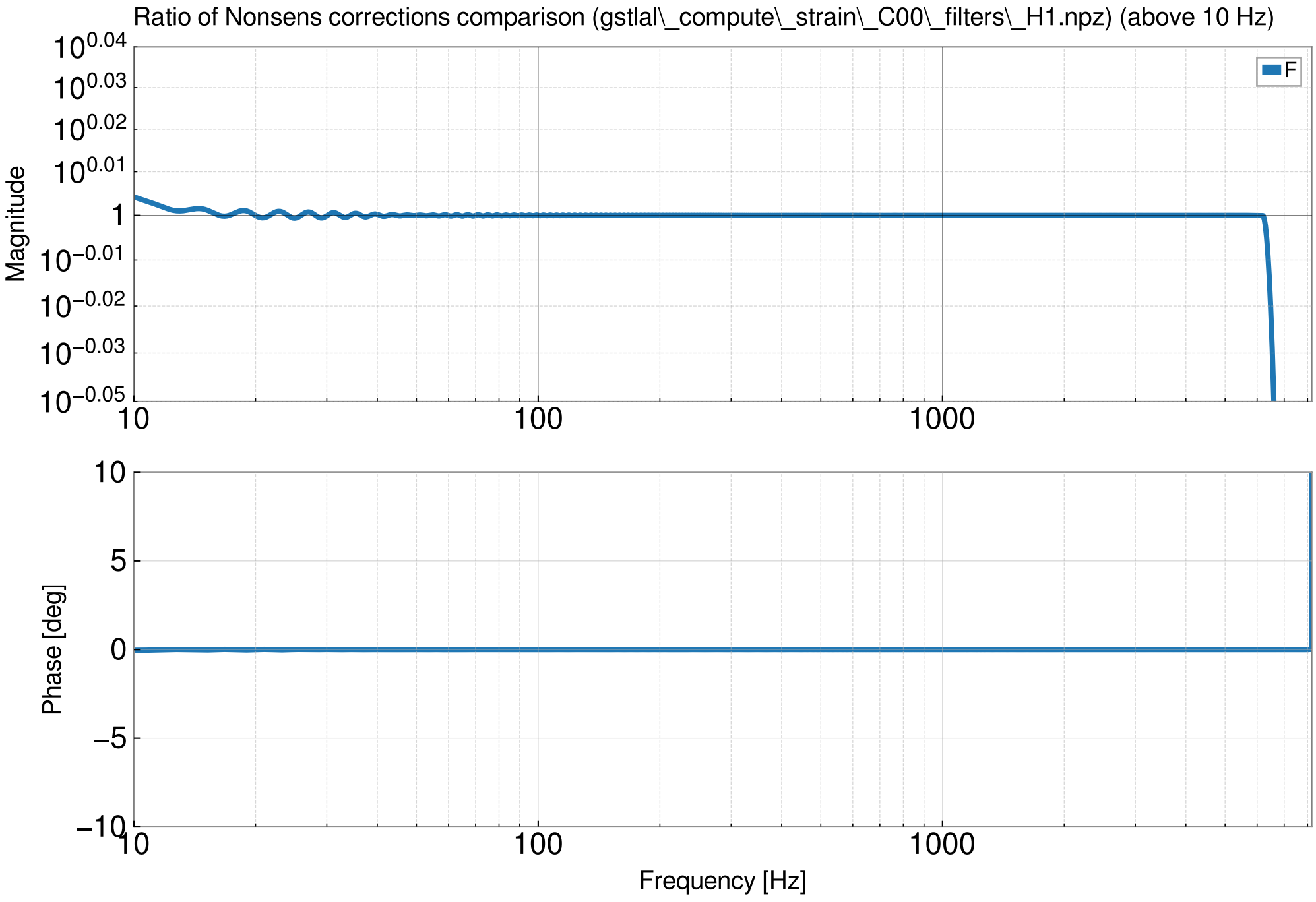

Res Corr No Pole
comparison (gstlal_compute_strain_C00_filters_H1.npz)
FIR filter
DARM model
Magnitude
10^{7}
10^{4}
10^{1}
10^{-2}
10^{-5}
1
10
100
1000
Phase [deg]
100
0
−100
1
10
100
1000
Frequency [Hz]

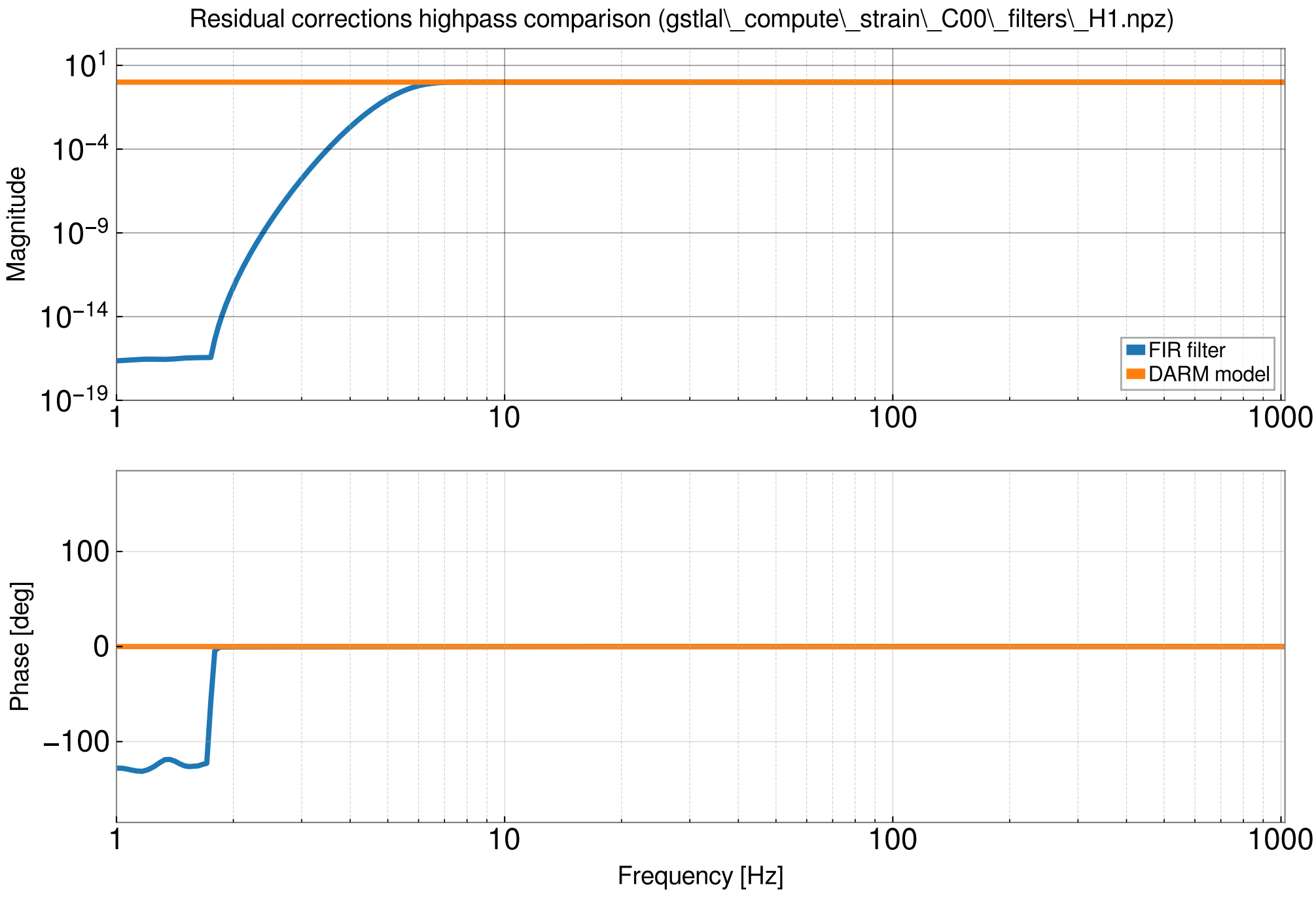

Ratio of Res Corr No Pole
comparison (gstlal_compute_strain_C00_filters_H1.npz)
F
Magnitude
10^{1}
10^{-1}
10^{-3}
10^{-5}
10^{-7}
1
10
100
1000
Phase [deg]
150
100
50
0
1
10
100
1000
Frequency [Hz]

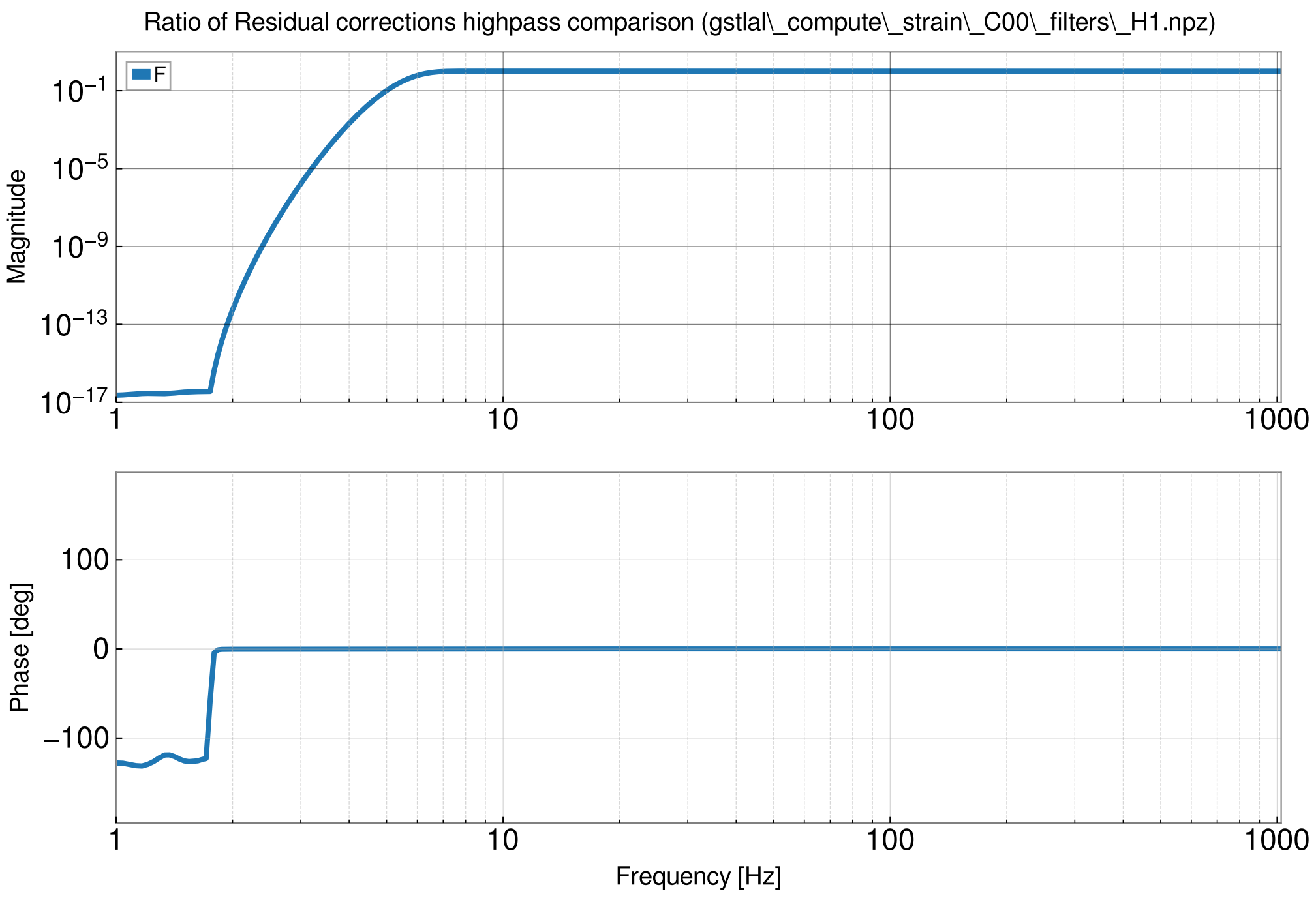

Ratio of Res Corr No Pole
comparison (gstlal_compute_strain_C00_filters_H1.npz) (above 10 Hz)
F
Magnitude
$10^{0.04}$
$10^{0.03}$
$10^{0.02}$
$10^{0.01}$
1
$10^{-0.01}$
$10^{-0.02}$
$10^{-0.03}$
$10^{-0.05}$
10
100
1000
Phase [deg]
10
5
0
−5
−10
10
100
1000
Frequency [Hz]

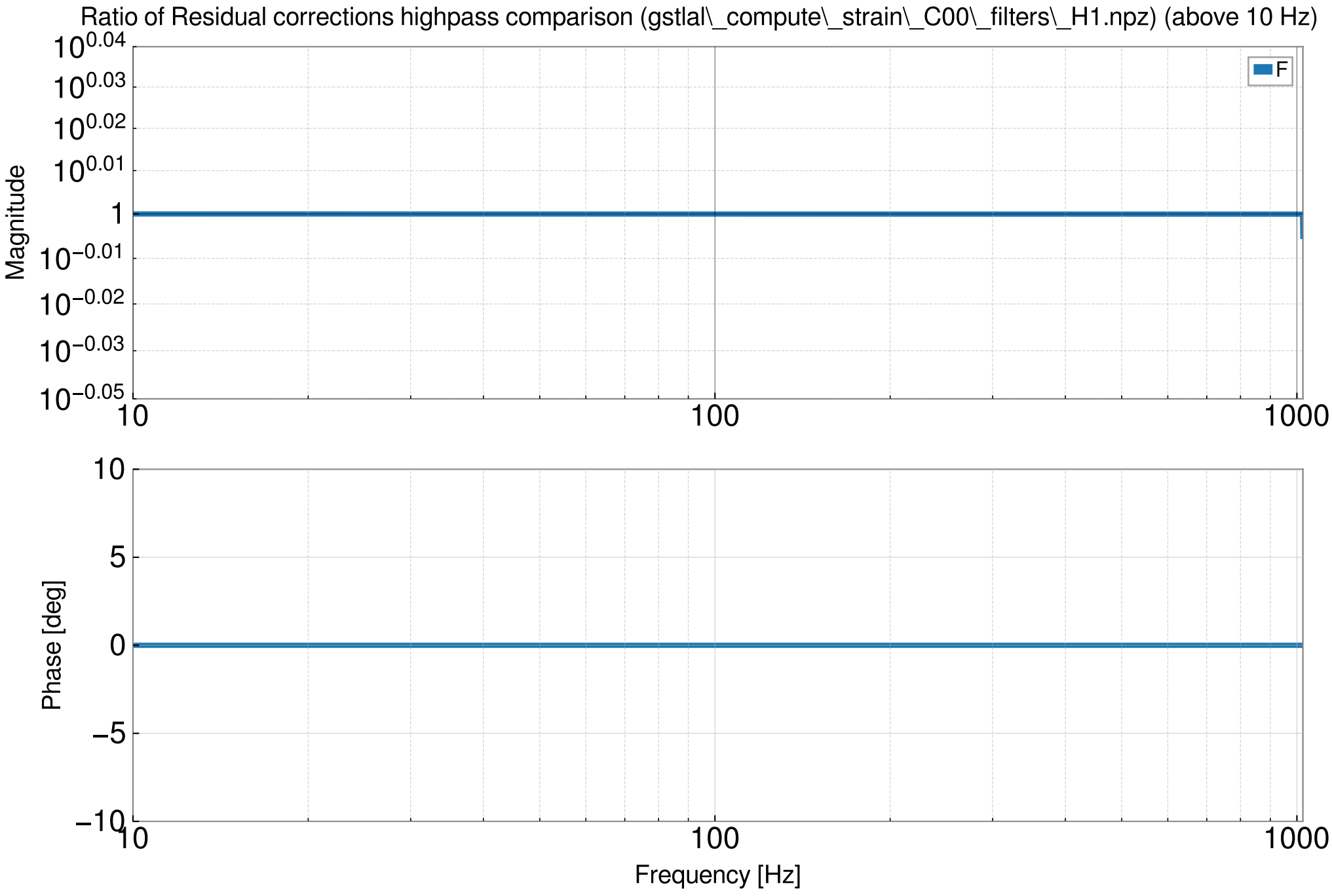

Nonsens corrections comparison (gstlal_compute_strain_C00_filters_H1.npz)
FIR filter
DARM model
Magnitude
10^{3}
10^{1}
10^{-1}
10^{-3}
10^{-5}
1
10
100
1000
Phase [deg]
100
0
−100
1
10
100
1000
Frequency [Hz]

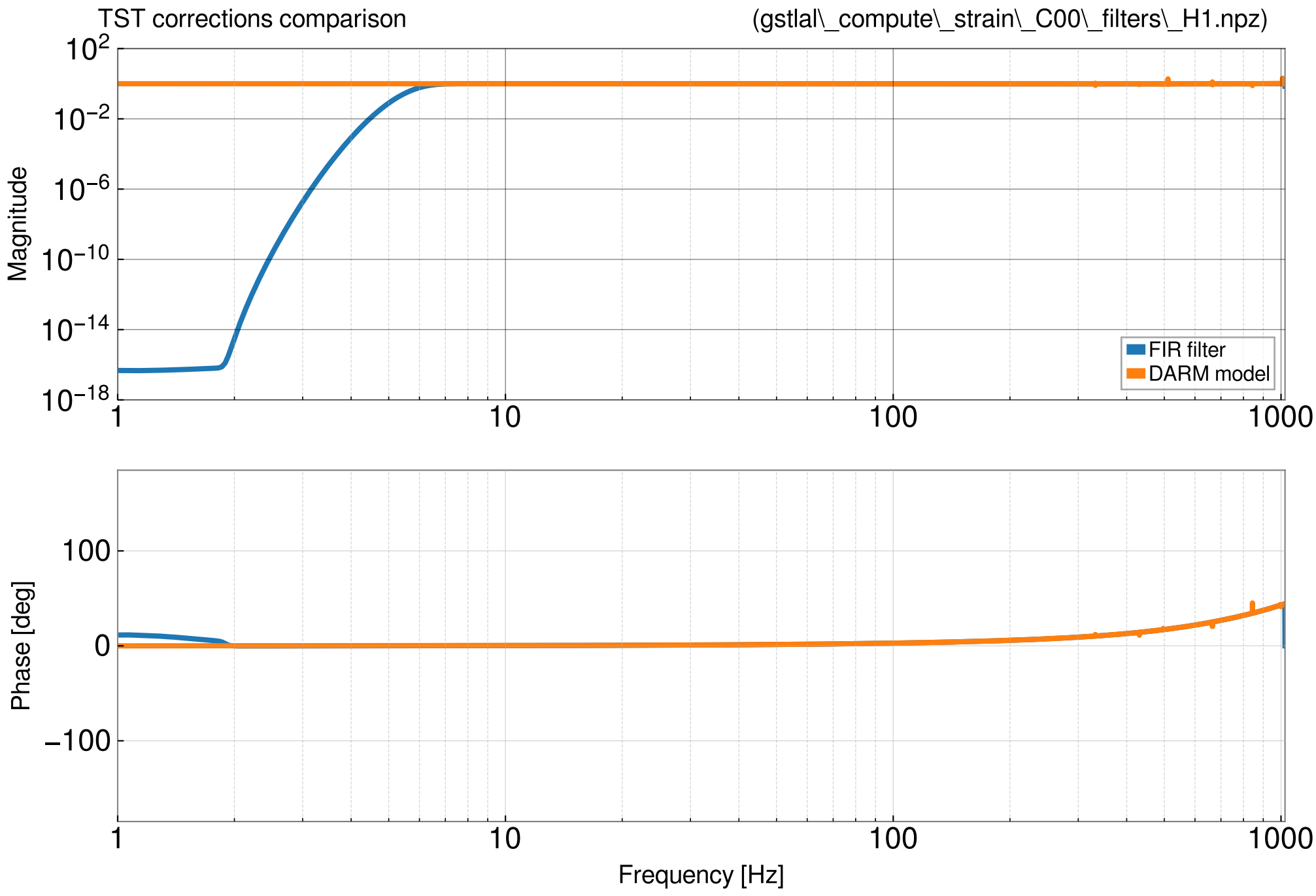

Ratio of Nonsens corrections comparison (gstlal_compute_strain_C00_filters_H1.npz)
Magnitude
10^{1}
10^{-1}
10^{-3}
10^{-5}
10^{-7}
F
1
10
100
1000
Phase [deg]
75
50
25
0
1
10
100
1000
Frequency [Hz]

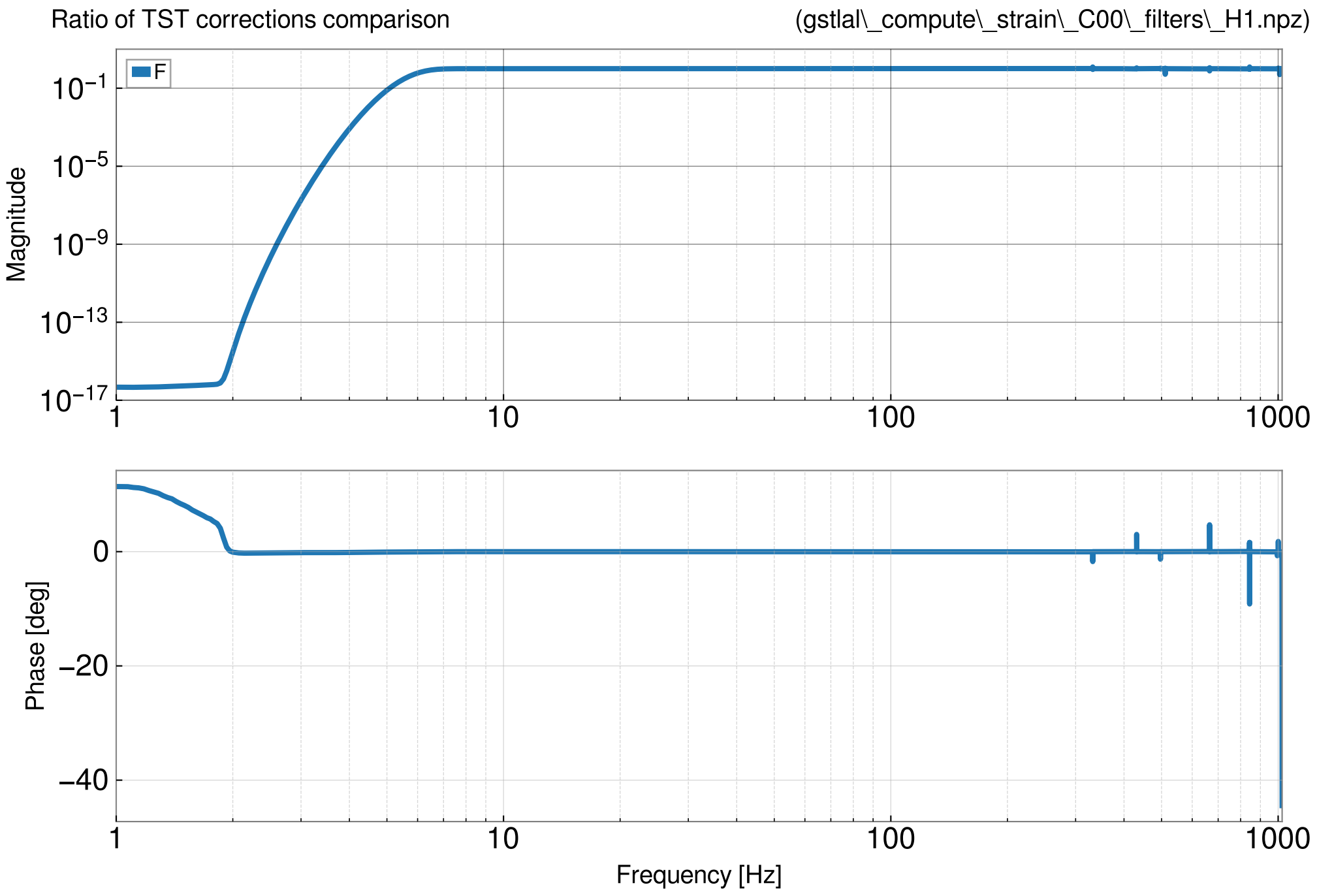

Ratio of Nonsens corrections comparison (gstlal_compute_strain_C00_filters_H1.npz) (above 10 Hz)
F
Magnitude
$10^{0.04}$
$10^{0.03}$
$10^{0.02}$
$10^{0.01}$
1
$10^{-0.01}$
$10^{-0.02}$
$10^{-0.03}$
$10^{-0.05}$
10
100
1000
Phase [deg]
10
5
0
−5
−10
10
100
1000
Frequency [Hz]

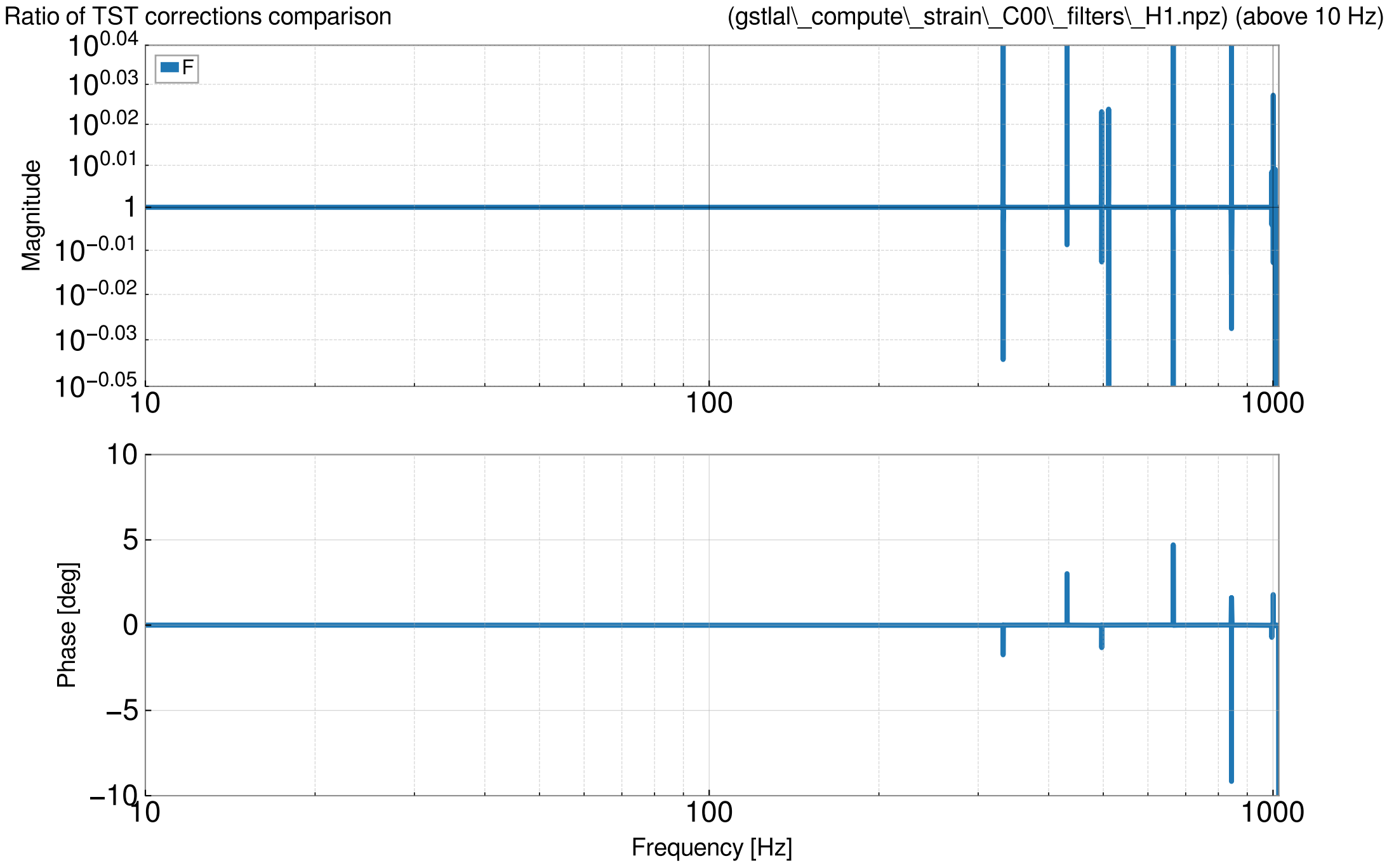

Residual corrections highpass comparison (gstlal_compute_strain_C00_filters_H1.npz)
Magnitude
10^{1}
10^{-4}
10^{-9}
10^{-14}
10^{-19}
1
10
100
1000
FIR filter
DARM model
Phase [deg]
100
0
−100
1
10
100
1000
Frequency [Hz]

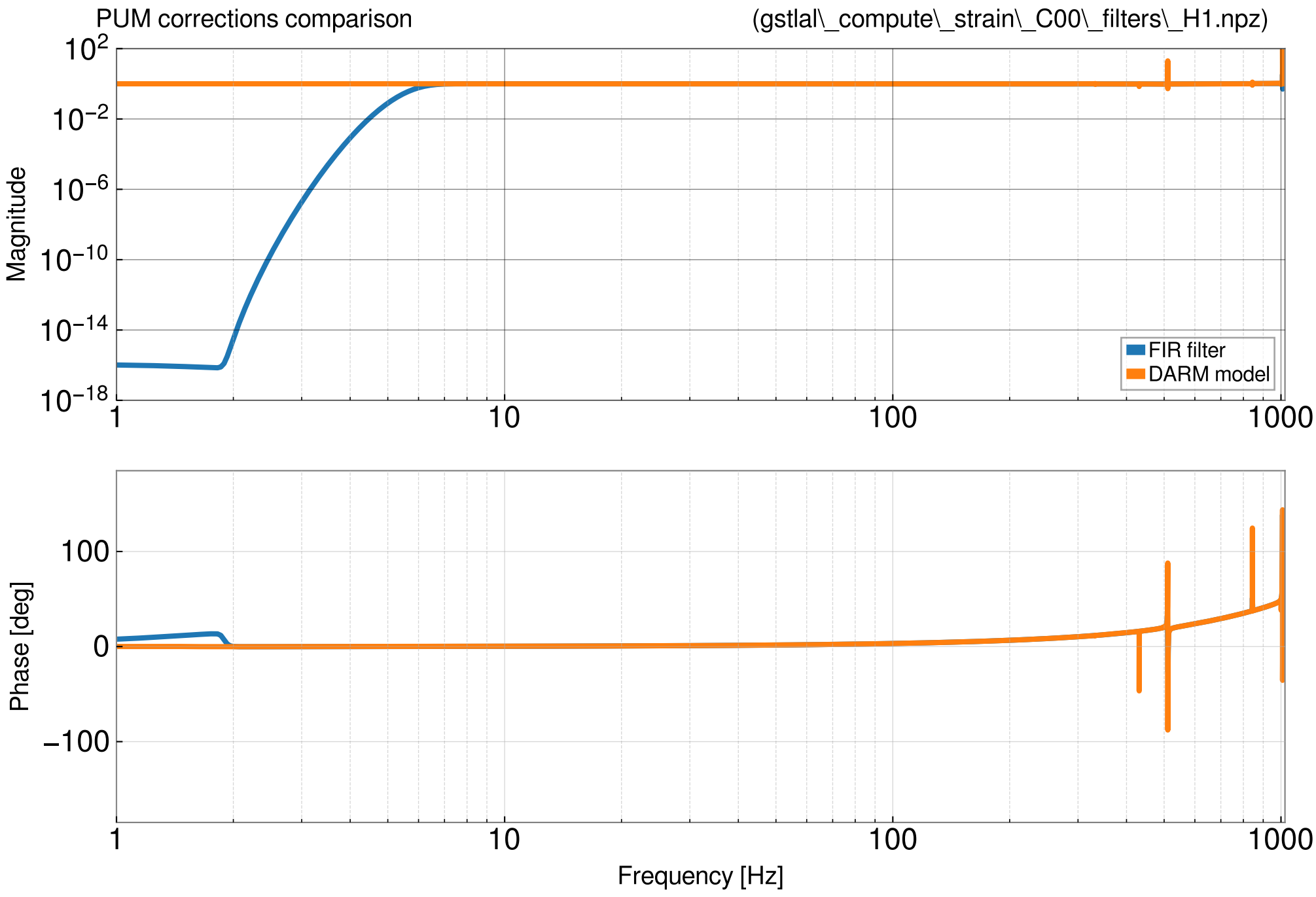

Ratio of Residual corrections highpass comparison (gstlal_compute_strain_C00_filters_H1.npz)
F
Magnitude
10^{-1}
10^{-5}
10^{-9}
10^{-13}
10^{-17}
1
10
100
1000
Phase [deg]
100
0
−100
1
10
100
1000
Frequency [Hz]

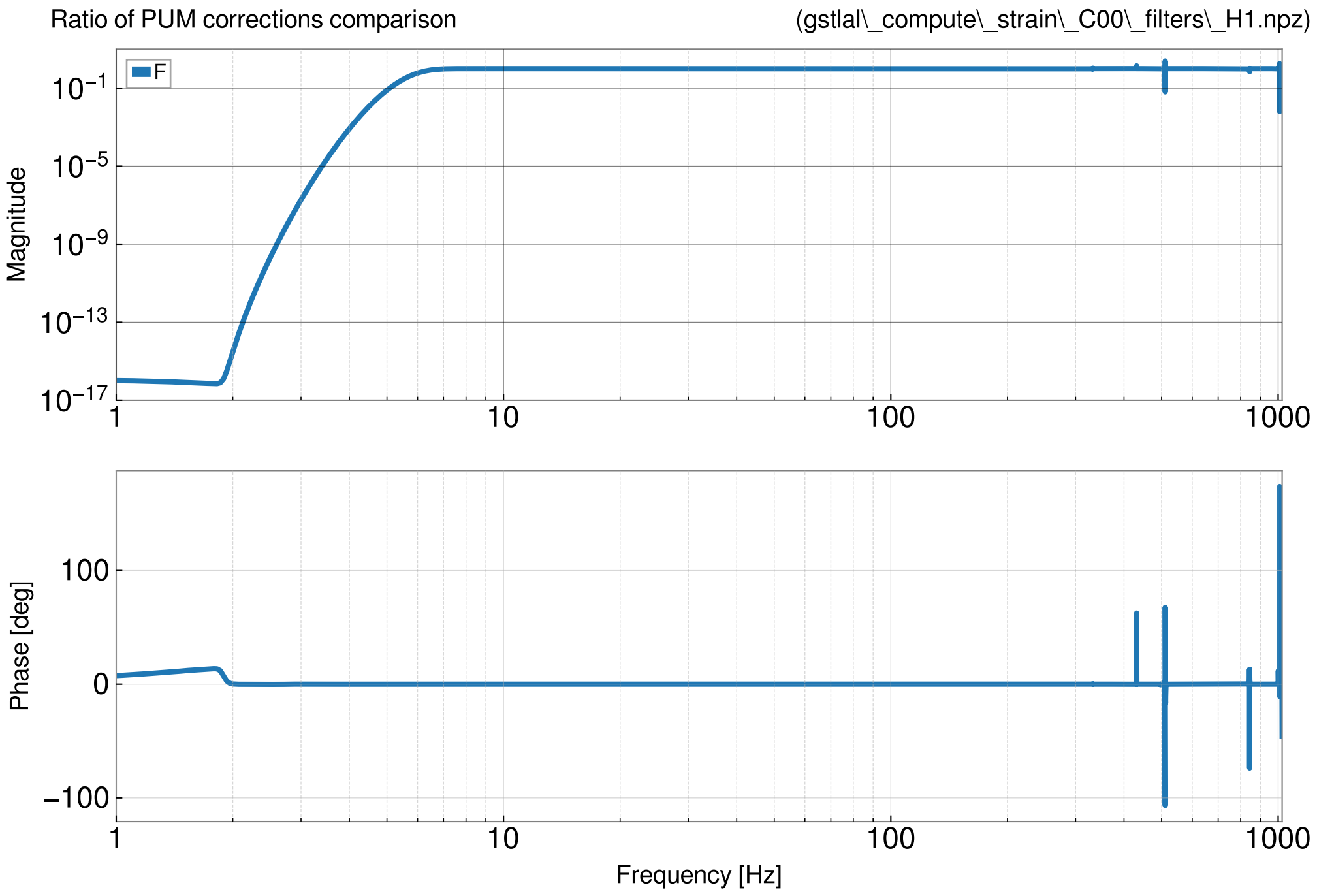

Ratio of Residual corrections highpass comparison (gstlal_compute_strain_C00_filters_H1.npz) (above 10 Hz)
Magnitude
$10^{0.04}$
$10^{0.03}$
$10^{0.02}$
$10^{0.01}$
1
$10^{-0.01}$
$10^{-0.02}$
$10^{-0.03}$
$10^{-0.05}$
F
10
100
1000
Phase [deg]
10
5
0
−5
−10
10
100
1000
Frequency [Hz]

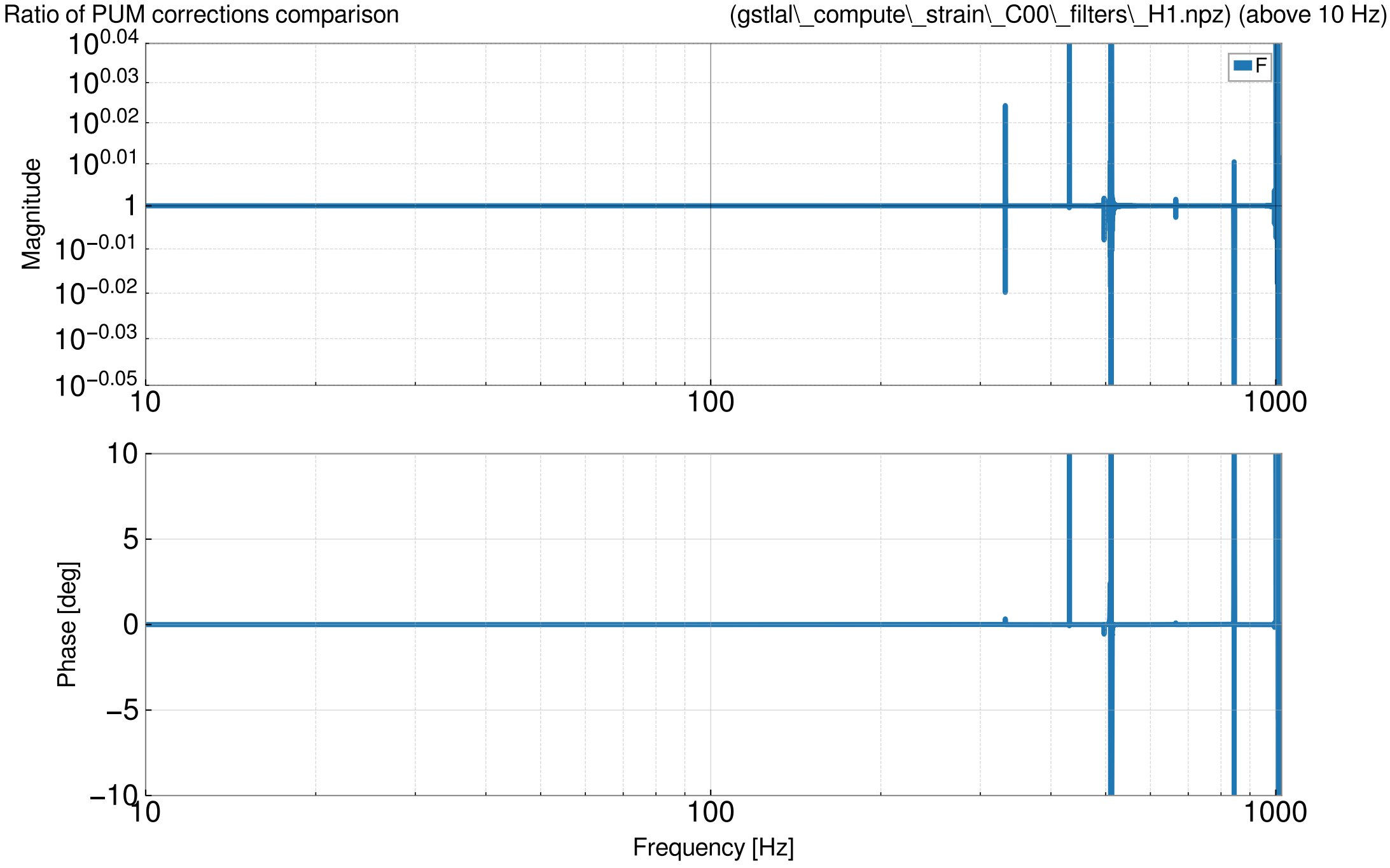

TST corrections comparison
(gstlal_compute_strain_C00_filters_H1.npz)
Magnitude
10^{2}
10^{-2}
10^{-6}
10^{-10}
10^{-14}
10^{-18}
1
10
100
1000
FIR filter
DARM model
Phase [deg]
100
0
−100
1
10
100
1000
Frequency [Hz]

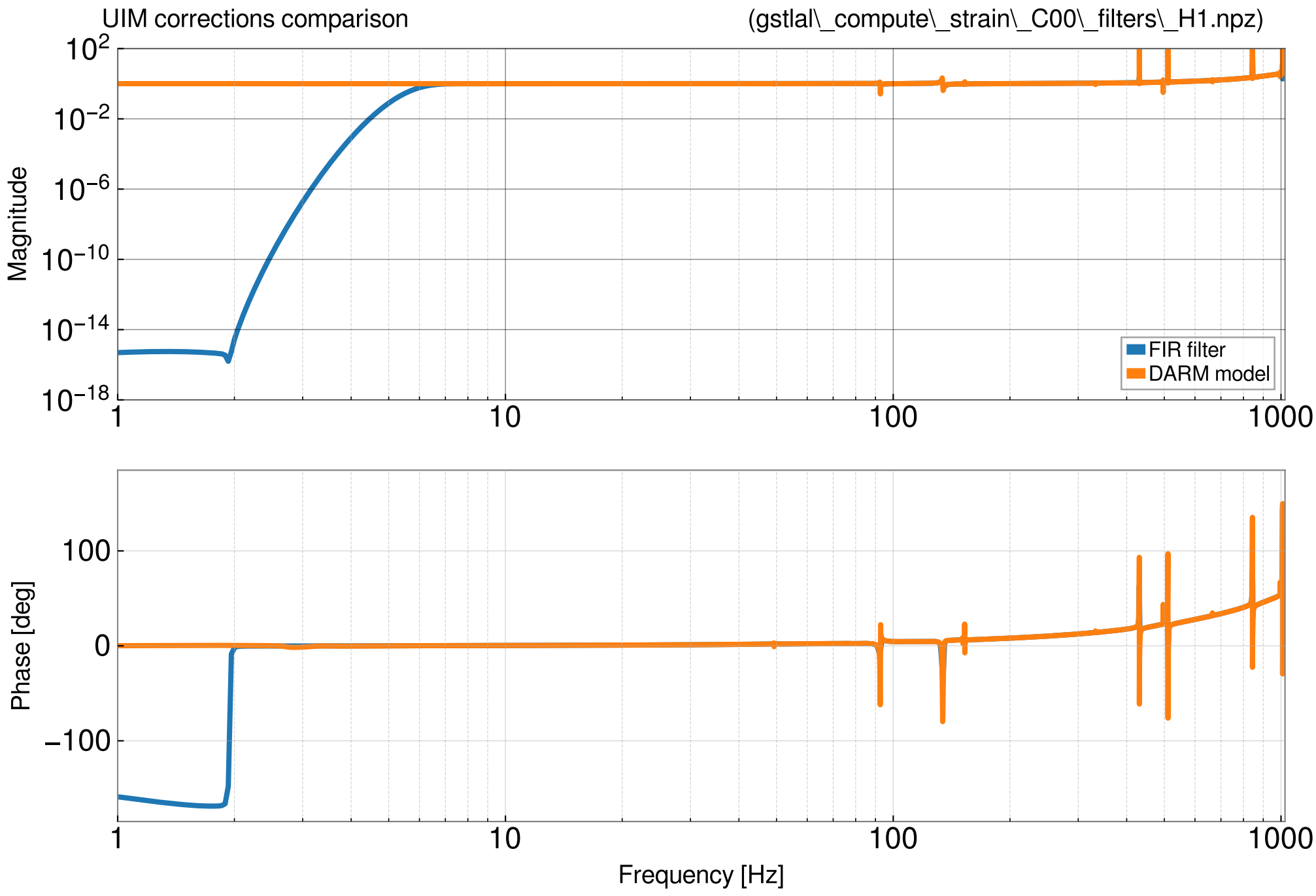

Ratio of TST corrections comparison
(gstlal_compute_strain_C00_filters_H1.npz)
F
Magnitude
10^{-1}
10^{-5}
10^{-9}
10^{-13}
10^{-17}
1
10
100
1000
Phase [deg]
0
−20
−40
1
10
100
1000
Frequency [Hz]

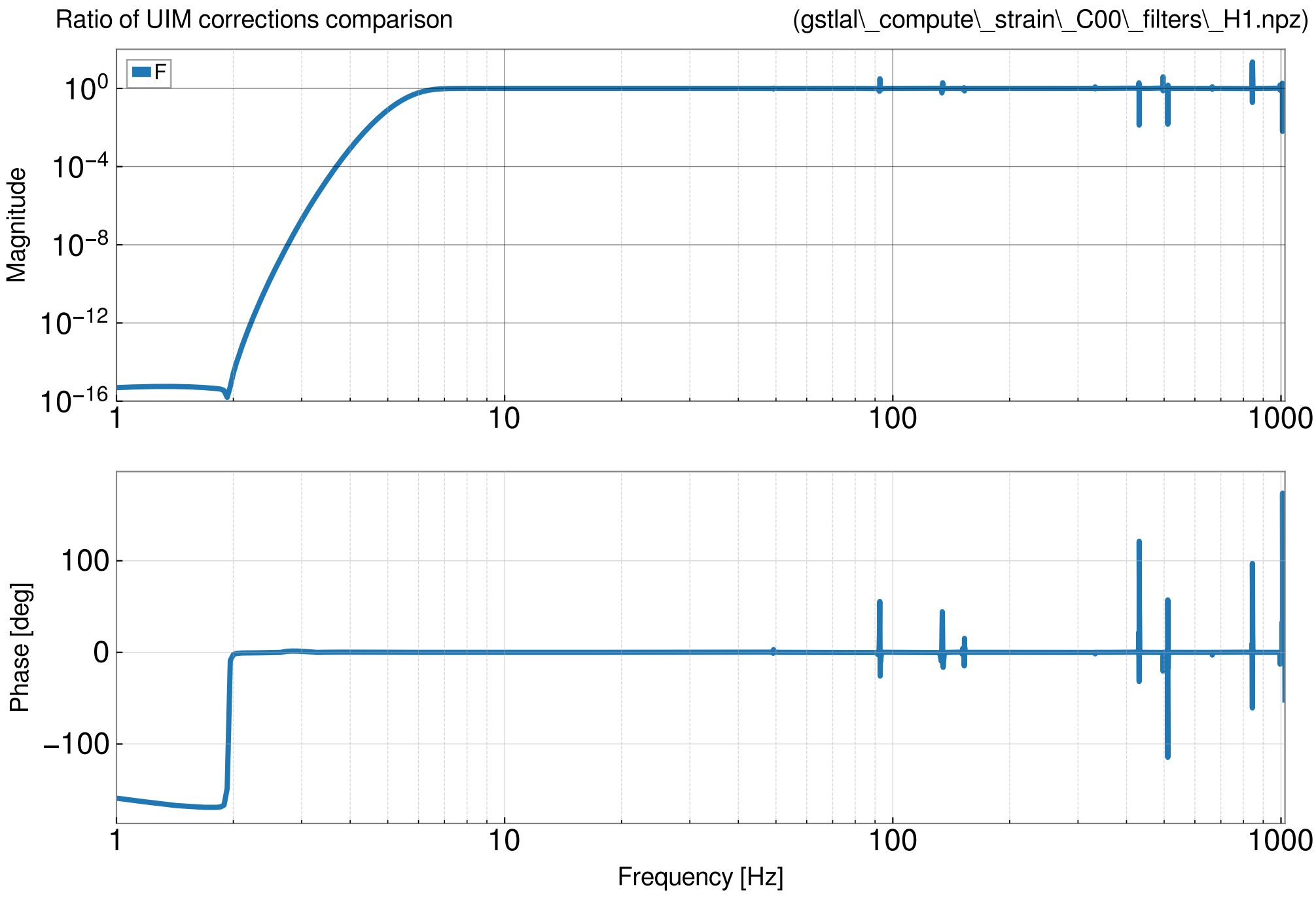

Ratio of TST corrections comparison
(gstlal_compute_strain_C00_filters_H1.npz) (above 10 Hz)
F
Magnitude
$10^{0.04}$
$10^{0.03}$
$10^{0.02}$
$10^{0.01}$
1
$10^{-0.01}$
$10^{-0.02}$
$10^{-0.03}$
$10^{-0.05}$
10
100
1000
Phase [deg]
10
5
0
−5
−10
10
100
1000
Frequency [Hz]

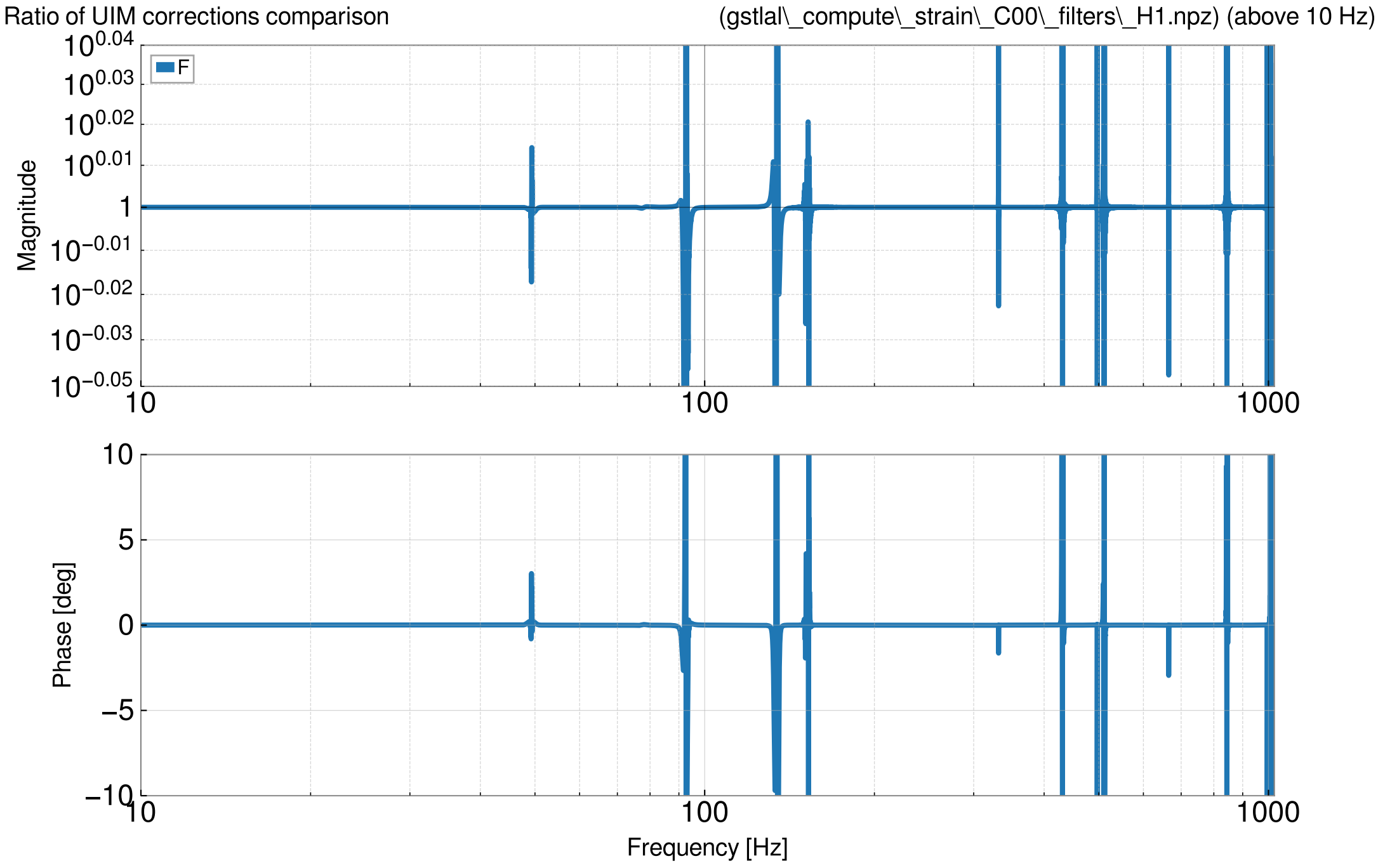

PUM corrections comparison
(gstlal_compute_strain_C00_filters_H1.npz)
Magnitude
10^{2}
10^{-2}
10^{-6}
10^{-10}
10^{-14}
10^{-18}
1
10
100
1000
FIR filter
DARM model
Phase [deg]
100
0
−100
1
10
100
1000
Frequency [Hz]


Ratio of PUM corrections comparison
(gstlal_compute_strain_C00_filters_H1.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 PUM corrections comparison
(gstlal_compute_strain_C00_filters_H1.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_H1.npz)
Magnitude
10^{2}
10^{-2}
10^{-6}
10^{-10}
10^{-14}
10^{-18}
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_H1.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_H1.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]