Science Objectives Assessment for HeavyIMRI1

Automated Report

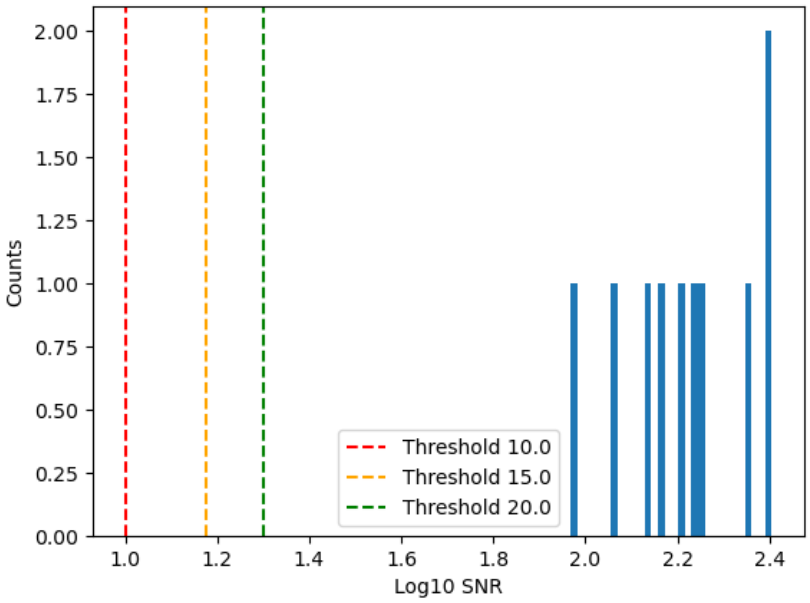
April 16, 2025

1 Summary

Source: HeavyIMRI1
SNR Status: PASS (SNR > 20.0) (Mean SNR = 172.87)

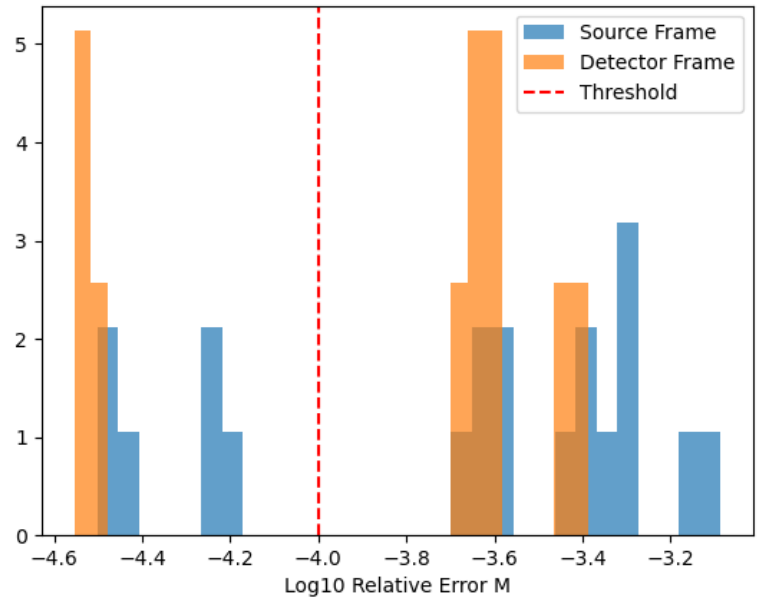
Parameter	Source Frame Value	Detector Frame Value
M central black hole mass	1000000.0	2000000.0
mu secondary black hole mass	1000.0	2000.0
a dimensionless central object spin	0.9	0.9
$\mathrm{p}_f finalsemi - latusrectum$	2.4286931234927924	2.4286931234927924
$\mathrm{e}_f finaleccentricity$	0.01	0.01
z redshift	1.0	1.0
dist luminosity distance in Gpc	6.877098982389288	6.877098982389288
T inspiral duration in years	0.1	0.1

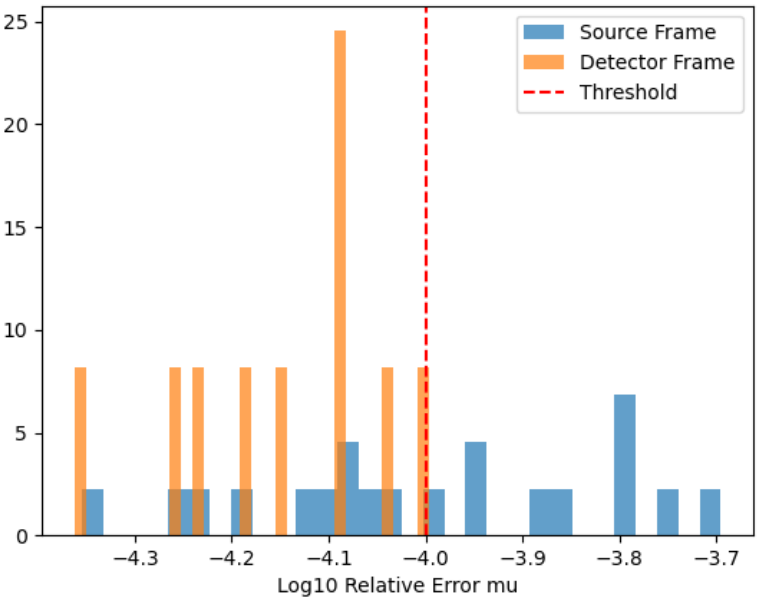
Parameter	Detector Frame Value Realization
M	1000000.0
mu	1000.0
a	0.9
p0	10.83234248808116
e0	0.08535840054635085
dist	6.877098982389288
qS	1.4268350475970675
phiS	6.093829971441197
qK	0.5725786424636955
phiK	5.7111842662775105
$\mathrm{Phi}_p hi0$	5.167735465596081
$\mathrm{Phi}_r 0$	4.086616282278329

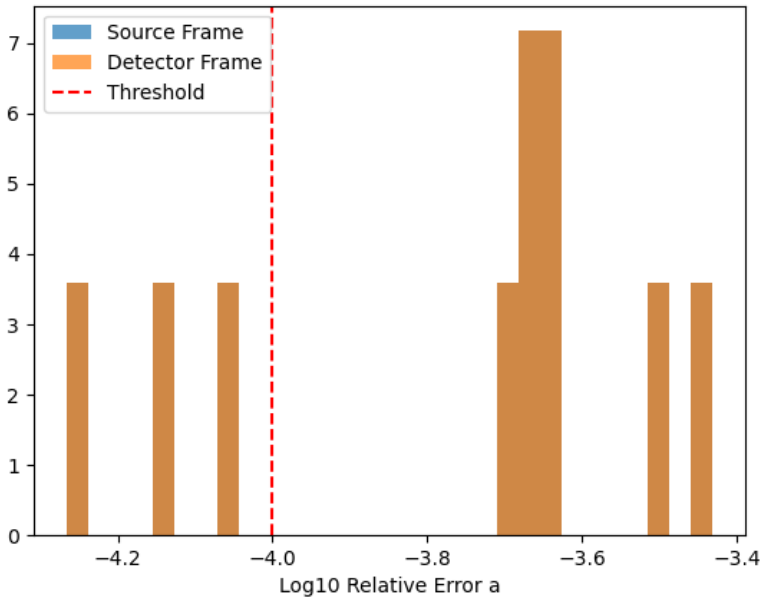


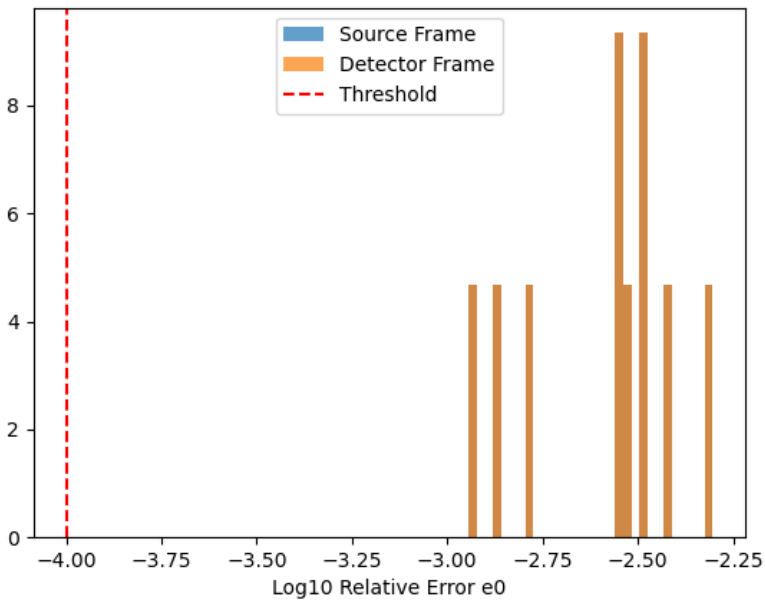
2 Parameter Relative Errors

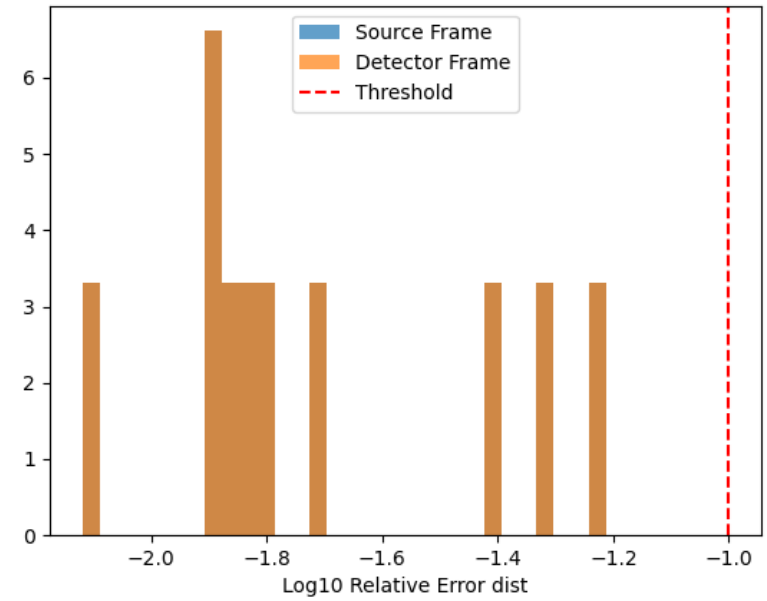
M: FAIL (Mean Error = 3.05e-04, Threshold = 1.00e-04)
mu: FAIL (Mean Error = 1.10e-04, Threshold = 1.00e-04)
a: FAIL (Mean Error = 2.01e-04, Threshold = 1.00e-04)
e0: FAIL (Mean Error = 2.82e-03, Threshold = 1.00e-04)
dist: PASS (Mean Error = 2.44e-02, Threshold = 1.00e-01)
Sky Localization: FAIL (Mean Error = 2.06e+01, Threshold = 1.00e+01)

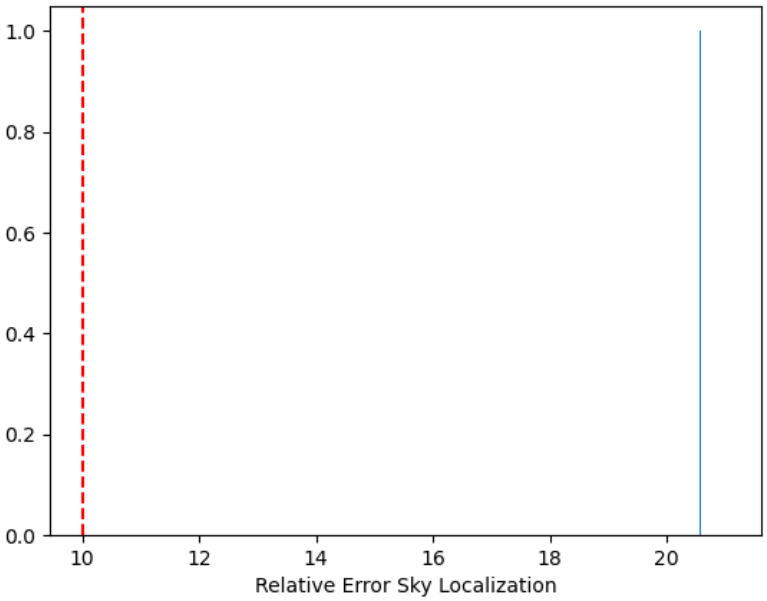

Source Frame
Detector Frame
Threshold
0
1
2
3
4
5
−4.6
−4.4
−4.2
−4.0
−3.8
−3.6
−3.4
−3.2
Log10 Relative Error M

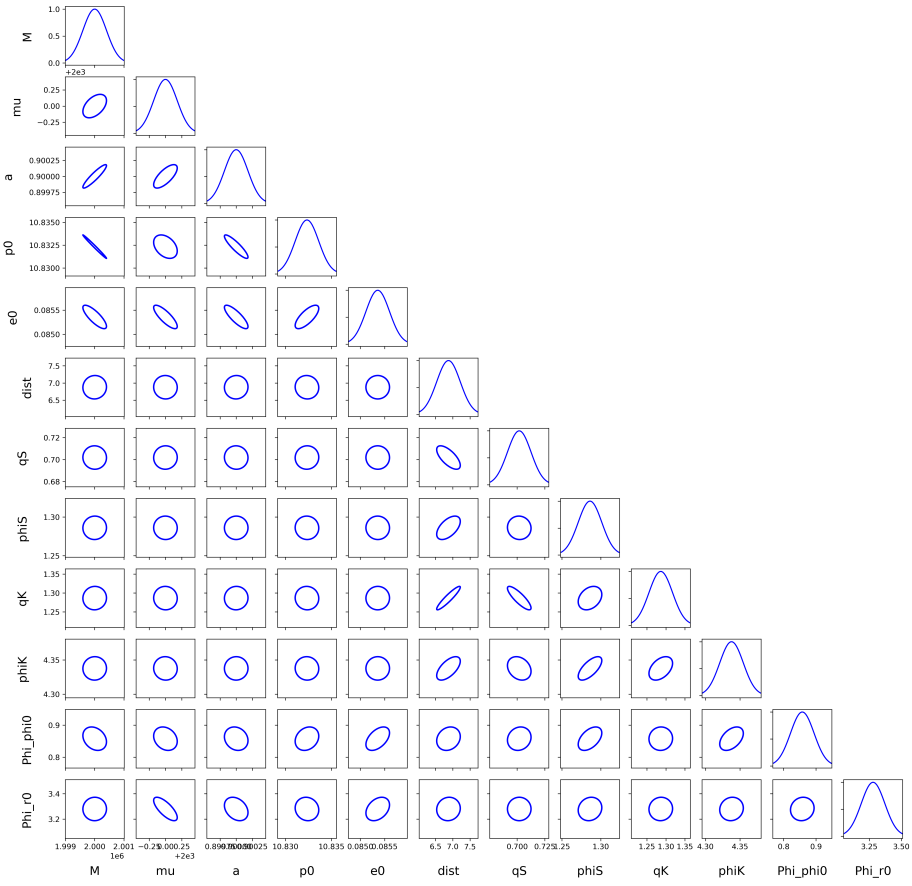

Source Frame
Detector Frame
Threshold
0
5
10
15
20
25
−4.3
−4.2
−4.1
−4.0
−3.9
−3.8
−3.7
Log10 Relative Error mu

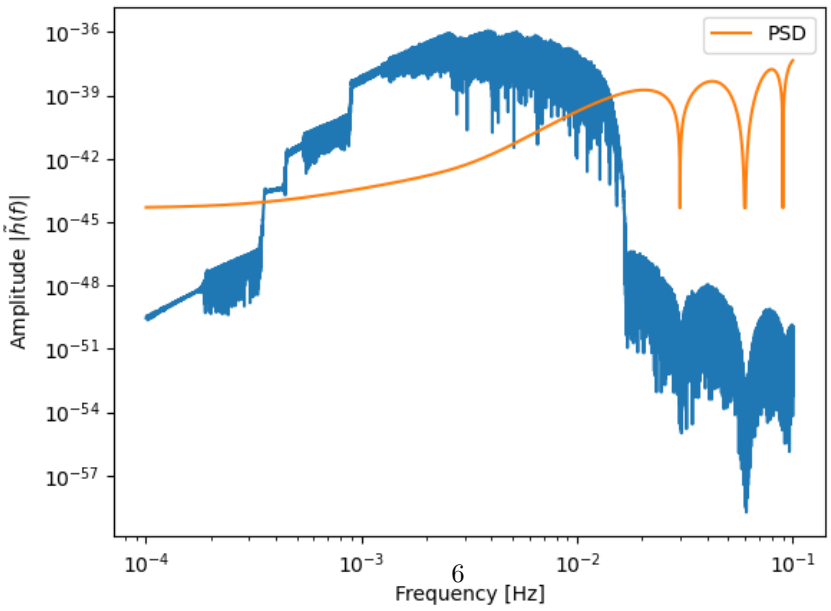

Source Frame
Detector Frame
Threshold
0
1
2
3
4
5
6
7
−4.2
−4.0
−3.8
−3.6
−3.4
Log10 Relative Error a


Source Frame
Detector Frame
Threshold
0
2
4
6
8
−4.00
−3.75
−3.50
−3.25
−3.00
−2.75
−2.50
−2.25
Log10 Relative Error e0


Source Frame
Detector Frame
Threshold
0
1
2
3
4
5
6
−2.0
−1.8
−1.6
−1.4
−1.2
−1.0
Log10 Relative Error dist


0.0
0.2
0.4
0.6
0.8
1.0
10
12
14
16
18
20
Relative Error Sky Localization


M
mu
a
p0
e0
dist
qS
phiS
qK
phiK
Phi_phi0
Phi_r0
+2e3
1e6


PSD
Amplitude $|\tilde{h}(f)|$
Frequency [Hz]
10^{-36}
10^{-39}
10^{-42}
10^{-45}
10^{-48}
10^{-51}
10^{-54}
10^{-57}
10^{-4}
10^{-3}
10^{-2}
10^{-1}