

# SUS\_TopMassOSEMs\_12-01

December 1, 2023

```
[ ]: from gwpy.timeseries import TimeSeries
     from gwpy.plot import Plot
```

```
[ ]: ReferenceTime = 1385396576
```

```
#CheckTime = 1345560072 # At least SR2 was rubbing here.
CheckTime = 1385436898 # Middle of night, IFO should be DOWN

dt = 60
```

```
[ ]: optics = {'ITMX': {'stage': 'M0', 'dofs': ['L', 'P', 'Y', 'R', 'T', 'V']},
              'ITMY': {'stage': 'M0', 'dofs': ['L', 'P', 'Y', 'R', 'T', 'V']},
              'ETMX': {'stage': 'M0', 'dofs': ['L', 'P', 'Y', 'R', 'T', 'V']},
              'ETMY': {'stage': 'M0', 'dofs': ['L', 'P', 'Y', 'R', 'T', 'V']},
              'BS': {'stage': 'M1', 'dofs': ['L', 'P', 'Y', 'R', 'T', 'V']},
              'PRM': {'stage': 'M1', 'dofs': ['L', 'P', 'Y', 'R', 'T', 'V']},
              'PR2': {'stage': 'M1', 'dofs': ['L', 'P', 'Y', 'R', 'T', 'V']},
              'PR3': {'stage': 'M1', 'dofs': ['L', 'P', 'Y', 'R', 'T', 'V']},
              'SRM': {'stage': 'M1', 'dofs': ['L', 'P', 'Y', 'R', 'T', 'V']},
              'SR2': {'stage': 'M1', 'dofs': ['L', 'P', 'Y', 'R', 'T', 'V']},
              'SR3': {'stage': 'M1', 'dofs': ['L', 'P', 'Y', 'R', 'T', 'V']},
              'MC1': {'stage': 'M1', 'dofs': ['L', 'P', 'Y', 'R', 'T', 'V']},
              'MC2': {'stage': 'M1', 'dofs': ['L', 'P', 'Y', 'R', 'T', 'V']},
              'MC3': {'stage': 'M1', 'dofs': ['L', 'P', 'Y', 'R', 'T', 'V']},
              'TMSX': {'stage': 'M1', 'dofs': ['L', 'P', 'Y', 'R', 'T', 'V']},
              'TMSY': {'stage': 'M1', 'dofs': ['L', 'P', 'Y', 'R', 'T', 'V']},
              'IM1': {'stage': 'M1', 'dofs': ['L', 'P', 'Y']},
              'IM2': {'stage': 'M1', 'dofs': ['L', 'P', 'Y']},
              'IM3': {'stage': 'M1', 'dofs': ['L', 'P', 'Y']},
              'IM4': {'stage': 'M1', 'dofs': ['L', 'P', 'Y']},
              'RM1': {'stage': 'M1', 'dofs': ['L', 'P', 'Y']},
              'RM2': {'stage': 'M1', 'dofs': ['L', 'P', 'Y']},
              'OM1': {'stage': 'M1', 'dofs': ['L', 'P', 'Y']},
              'OM2': {'stage': 'M1', 'dofs': ['L', 'P', 'Y']},
              'OM3': {'stage': 'M1', 'dofs': ['L', 'P', 'Y']},
              'OMC': {'stage': 'M1', 'dofs': ['L', 'P', 'Y', 'R', 'T', 'V']},
              'OFI': {'stage': 'M1', 'dofs': ['L', 'T', 'Y']},
              'ZM1': {'stage': 'M1', 'dofs': ['L', 'P', 'Y']},
```

```

        'ZM2': {'stage': 'M1', 'dofs': ['L','P','Y']},
        'ZM3': {'stage': 'M1', 'dofs': ['L','P','Y']},
    }
for optic in optics.keys():
    chanlist = []
    for dof in optics[optic]['dofs']:
        chanlist.append('H1:SUS-%s_%s_DAMP_%s_IN1_DQ'%(optic,
↳optics[optic]['stage'], dof))

    optics[optic]['chanlist'] = chanlist

```

```

[ ]: myplot = {}

for optic in optics.keys():
    myplot[optic] = Plot(figsize=(50,8))
    ii = 0
    for dof in optics[optic]['dofs']:
        ii += 1
        myplot[optic].add_subplot(1, len(optics[optic]['dofs']), ii)

        print('Fetching data for %s'%optics[optic]['chanlist'][ii-1])
        refData = TimeSeries.fetch(optics[optic]['chanlist'][ii-1],
↳ReferenceTime, ReferenceTime+dt).asd(8,4)
        checkData = TimeSeries.fetch(optics[optic]['chanlist'][ii-1],
↳CheckTime, CheckTime+dt).asd(8,4)

        ax = myplot[optic].gca()
        ax.plot(refData, label='Reference time %s'%ReferenceTime)
        ax.plot(checkData, label='Check time %s'%CheckTime)
        ax.set_xscale('log')
        ax.set_yscale('log')
        ax.set_xlabel('Frequency [Hz]')
        ax.set_ylabel('Optic Motion [um/rtHz or urad/rtHz]')
        ax.set_title(optics[optic]['chanlist'][ii-1])
        ax.legend()

```

```

Fetching data for H1:SUS-ITMX_MO_DAMP_L_IN1_DQ
Fetching data for H1:SUS-ITMX_MO_DAMP_P_IN1_DQ
Fetching data for H1:SUS-ITMX_MO_DAMP_Y_IN1_DQ
Fetching data for H1:SUS-ITMX_MO_DAMP_R_IN1_DQ
Fetching data for H1:SUS-ITMX_MO_DAMP_T_IN1_DQ
Fetching data for H1:SUS-ITMX_MO_DAMP_V_IN1_DQ
Fetching data for H1:SUS-ITMY_MO_DAMP_L_IN1_DQ
Fetching data for H1:SUS-ITMY_MO_DAMP_P_IN1_DQ
Fetching data for H1:SUS-ITMY_MO_DAMP_Y_IN1_DQ

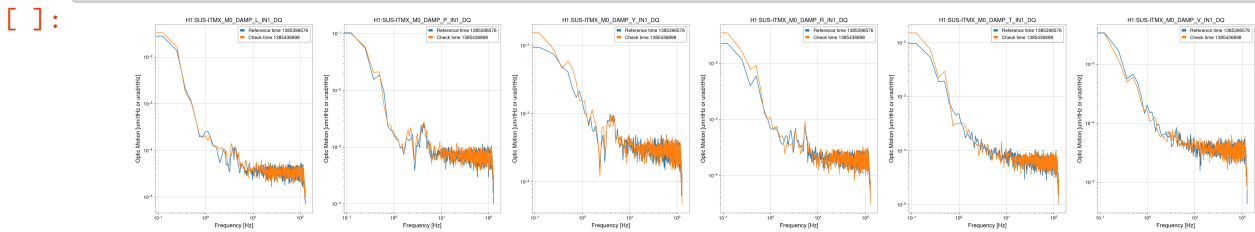
```

Fetching data for H1:SUS-ITMY\_MO\_DAMP\_R\_IN1\_DQ  
Fetching data for H1:SUS-ITMY\_MO\_DAMP\_T\_IN1\_DQ  
Fetching data for H1:SUS-ITMY\_MO\_DAMP\_V\_IN1\_DQ  
Fetching data for H1:SUS-ETMX\_MO\_DAMP\_L\_IN1\_DQ  
Fetching data for H1:SUS-ETMX\_MO\_DAMP\_P\_IN1\_DQ  
Fetching data for H1:SUS-ETMX\_MO\_DAMP\_Y\_IN1\_DQ  
Fetching data for H1:SUS-ETMX\_MO\_DAMP\_R\_IN1\_DQ  
Fetching data for H1:SUS-ETMX\_MO\_DAMP\_T\_IN1\_DQ  
Fetching data for H1:SUS-ETMX\_MO\_DAMP\_V\_IN1\_DQ  
Fetching data for H1:SUS-ETMY\_MO\_DAMP\_L\_IN1\_DQ  
Fetching data for H1:SUS-ETMY\_MO\_DAMP\_P\_IN1\_DQ  
Fetching data for H1:SUS-ETMY\_MO\_DAMP\_Y\_IN1\_DQ  
Fetching data for H1:SUS-ETMY\_MO\_DAMP\_R\_IN1\_DQ  
Fetching data for H1:SUS-ETMY\_MO\_DAMP\_T\_IN1\_DQ  
Fetching data for H1:SUS-ETMY\_MO\_DAMP\_V\_IN1\_DQ  
Fetching data for H1:SUS-BS\_M1\_DAMP\_L\_IN1\_DQ  
Fetching data for H1:SUS-BS\_M1\_DAMP\_P\_IN1\_DQ  
Fetching data for H1:SUS-BS\_M1\_DAMP\_Y\_IN1\_DQ  
Fetching data for H1:SUS-BS\_M1\_DAMP\_R\_IN1\_DQ  
Fetching data for H1:SUS-BS\_M1\_DAMP\_T\_IN1\_DQ  
Fetching data for H1:SUS-BS\_M1\_DAMP\_V\_IN1\_DQ  
Fetching data for H1:SUS-PRM\_M1\_DAMP\_L\_IN1\_DQ  
Fetching data for H1:SUS-PRM\_M1\_DAMP\_P\_IN1\_DQ  
Fetching data for H1:SUS-PRM\_M1\_DAMP\_Y\_IN1\_DQ  
Fetching data for H1:SUS-PRM\_M1\_DAMP\_R\_IN1\_DQ  
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Fetching data for H1:SUS-PR2\_M1\_DAMP\_Y\_IN1\_DQ  
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Fetching data for H1:SUS-PR2\_M1\_DAMP\_T\_IN1\_DQ  
Fetching data for H1:SUS-PR2\_M1\_DAMP\_V\_IN1\_DQ  
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Fetching data for H1:SUS-PR3\_M1\_DAMP\_P\_IN1\_DQ  
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Fetching data for H1:SUS-SR2\_M1\_DAMP\_Y\_IN1\_DQ

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Fetching data for H1:SUS-SR2\_M1\_DAMP\_T\_IN1\_DQ  
Fetching data for H1:SUS-SR2\_M1\_DAMP\_V\_IN1\_DQ  
Fetching data for H1:SUS-SR3\_M1\_DAMP\_L\_IN1\_DQ  
Fetching data for H1:SUS-SR3\_M1\_DAMP\_P\_IN1\_DQ  
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Fetching data for H1:SUS-MC1\_M1\_DAMP\_T\_IN1\_DQ  
Fetching data for H1:SUS-MC1\_M1\_DAMP\_V\_IN1\_DQ  
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Fetching data for H1:SUS-TMSX\_M1\_DAMP\_P\_IN1\_DQ  
Fetching data for H1:SUS-TMSX\_M1\_DAMP\_Y\_IN1\_DQ  
Fetching data for H1:SUS-TMSX\_M1\_DAMP\_R\_IN1\_DQ  
Fetching data for H1:SUS-TMSX\_M1\_DAMP\_T\_IN1\_DQ  
Fetching data for H1:SUS-TMSX\_M1\_DAMP\_V\_IN1\_DQ  
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Fetching data for H1:SUS-TMSY\_M1\_DAMP\_T\_IN1\_DQ  
Fetching data for H1:SUS-TMSY\_M1\_DAMP\_V\_IN1\_DQ  
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Fetching data for H1:SUS-IM1\_M1\_DAMP\_P\_IN1\_DQ  
Fetching data for H1:SUS-IM1\_M1\_DAMP\_Y\_IN1\_DQ  
Fetching data for H1:SUS-IM2\_M1\_DAMP\_L\_IN1\_DQ  
Fetching data for H1:SUS-IM2\_M1\_DAMP\_P\_IN1\_DQ  
Fetching data for H1:SUS-IM2\_M1\_DAMP\_Y\_IN1\_DQ  
Fetching data for H1:SUS-IM3\_M1\_DAMP\_L\_IN1\_DQ  
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Fetching data for H1:SUS-IM3\_M1\_DAMP\_Y\_IN1\_DQ

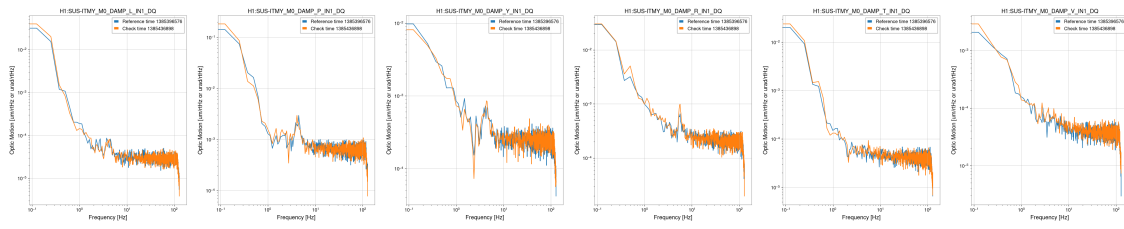
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 Fetching data for H1:SUS-RM1\_M1\_DAMP\_P\_IN1\_DQ  
 Fetching data for H1:SUS-RM1\_M1\_DAMP\_Y\_IN1\_DQ  
 Fetching data for H1:SUS-RM2\_M1\_DAMP\_L\_IN1\_DQ  
 Fetching data for H1:SUS-RM2\_M1\_DAMP\_P\_IN1\_DQ  
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 Fetching data for H1:SUS-OM2\_M1\_DAMP\_Y\_IN1\_DQ  
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 Fetching data for H1:SUS-OMC\_M1\_DAMP\_P\_IN1\_DQ  
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 Fetching data for H1:SUS-ZM2\_M1\_DAMP\_L\_IN1\_DQ  
 Fetching data for H1:SUS-ZM2\_M1\_DAMP\_P\_IN1\_DQ  
 Fetching data for H1:SUS-ZM2\_M1\_DAMP\_Y\_IN1\_DQ  
 Fetching data for H1:SUS-ZM3\_M1\_DAMP\_L\_IN1\_DQ  
 Fetching data for H1:SUS-ZM3\_M1\_DAMP\_P\_IN1\_DQ  
 Fetching data for H1:SUS-ZM3\_M1\_DAMP\_Y\_IN1\_DQ

```
[ ]: myplot['ITMX']
```



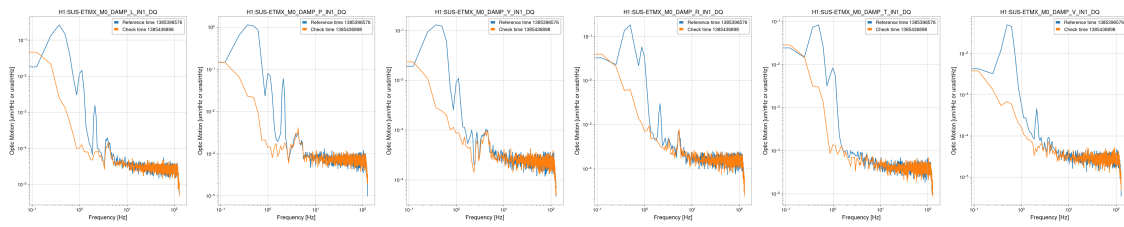
```
[ ]: myplot['ITMY']
```

```
[ ]:
```



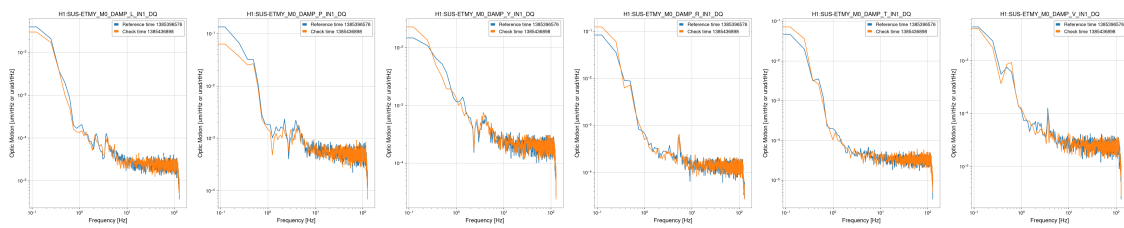
```
[ ]: myplot['ETMX']
```

```
[ ]:
```



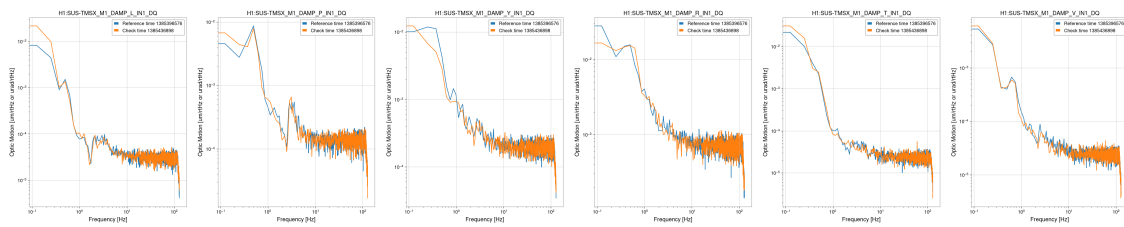
```
[ ]: myplot['ETMY']
```

```
[ ]:
```



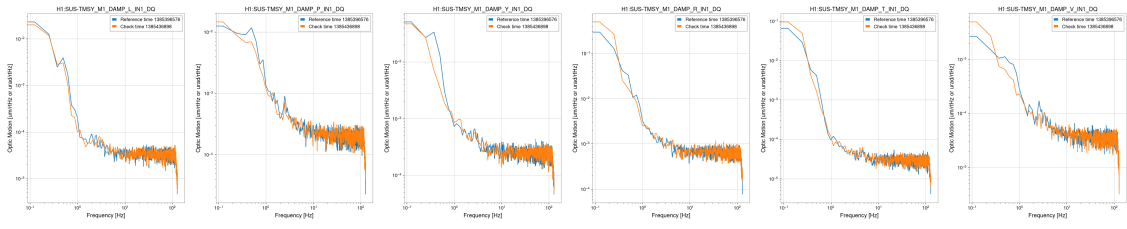
```
[ ]: myplot['TMSX']
```

```
[ ]:
```



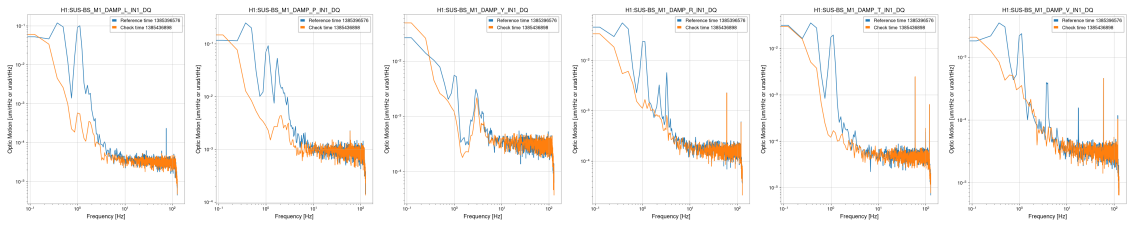
```
[ ]: myplot['TMSY']
```

```
[ ]:
```



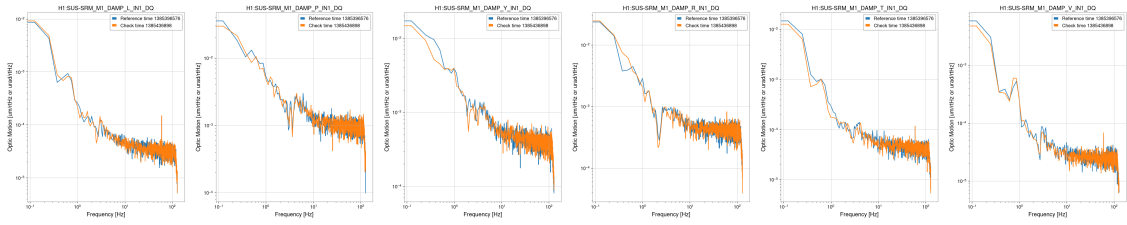
```
[ ]: myplot['BS']
```

```
[ ]:
```



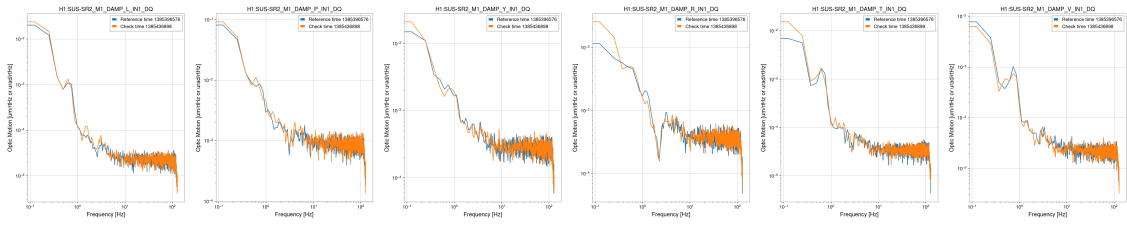
```
[ ]: myplot['SRM']
```

```
[ ]:
```



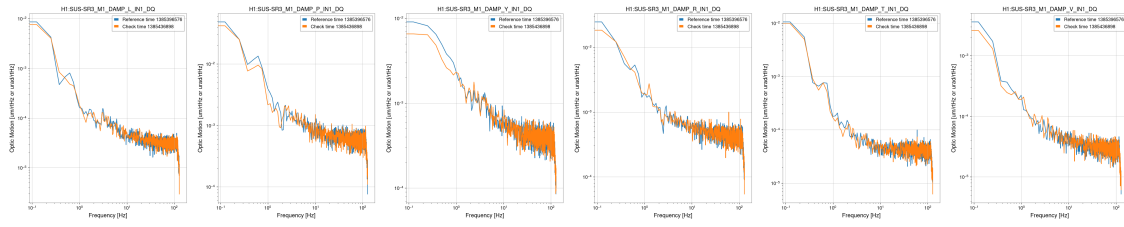
```
[ ]: myplot['SR2']
```

```
[ ]:
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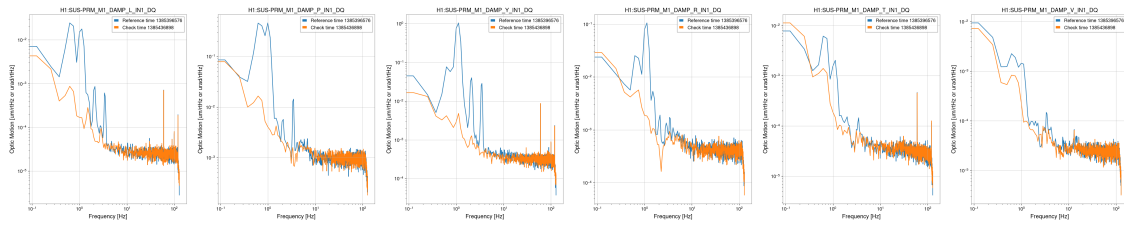
```
[ ]: myplot['SR3']
```

```
[ ]:
```



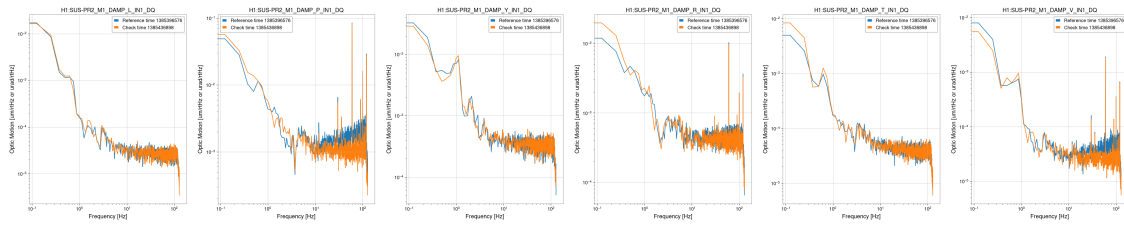
[ ]: myplot['PRM']

[ ]:



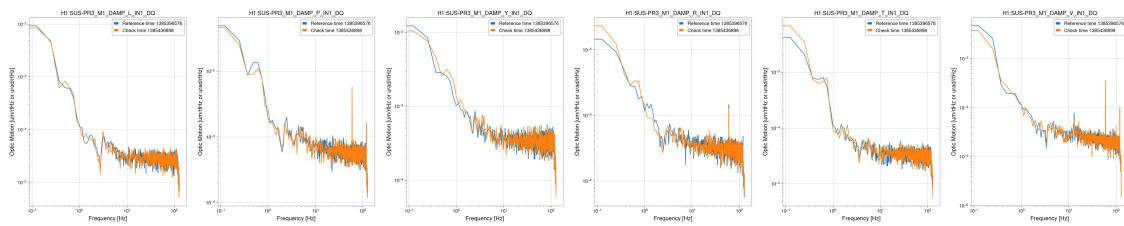
[ ]: myplot['PR2']

[ ]:



[ ]: myplot['PR3']

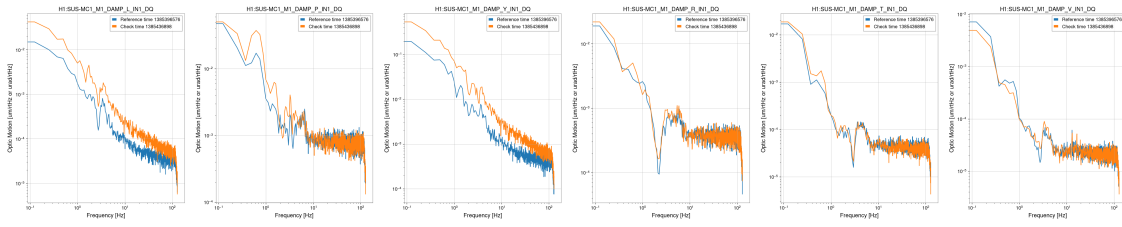
[ ]:



[ ]: myplot['MC1']

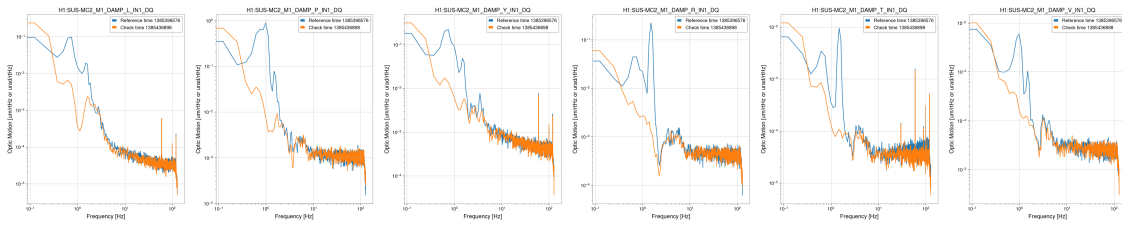
[ ]:





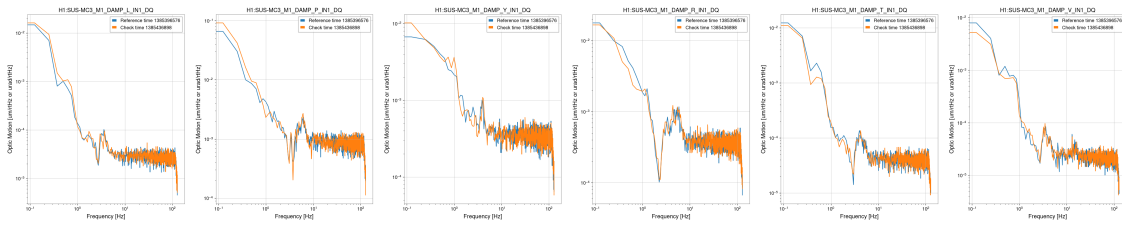
```
[ ]: myplot['MC2']
```

```
[ ]:
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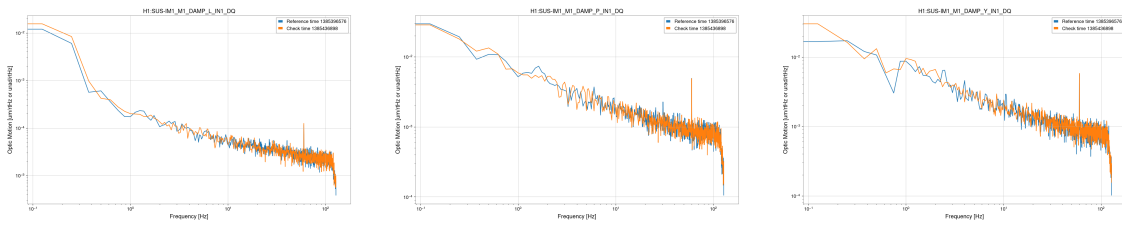
```
[ ]: myplot['MC3']
```

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[ ]:
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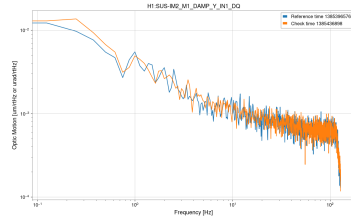
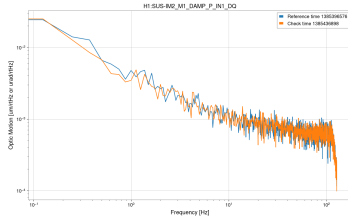
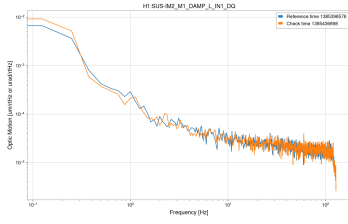
```
[ ]: myplot['IM1']
```

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[ ]:
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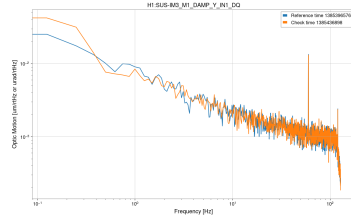
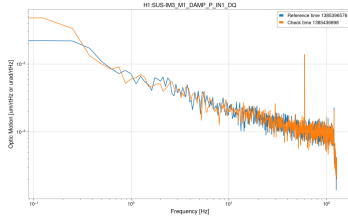
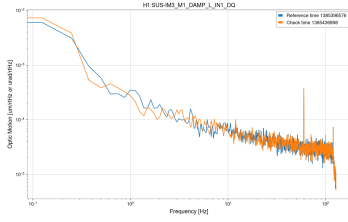
```
[ ]: myplot['IM2']
```

```
[ ]:
```



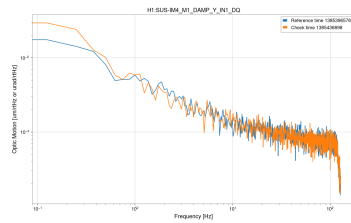
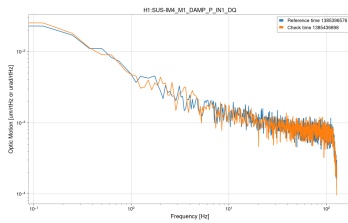
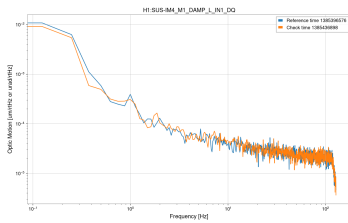
```
[ ]: myplot['IM3']
```

```
[ ]:
```



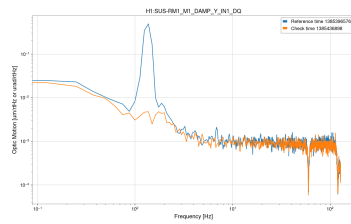
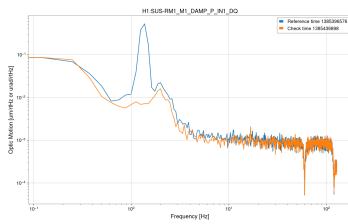
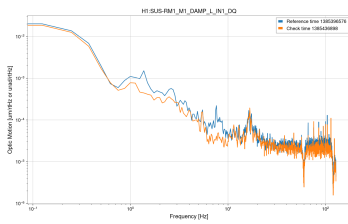
```
[ ]: myplot['IM4']
```

```
[ ]:
```



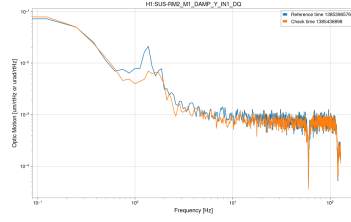
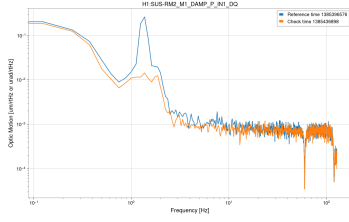
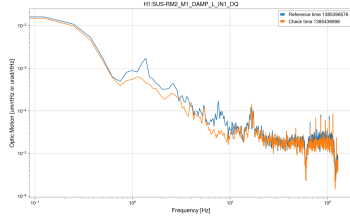
```
[ ]: myplot['RM1']
```

```
[ ]:
```



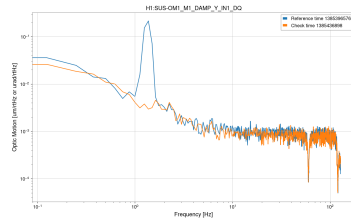
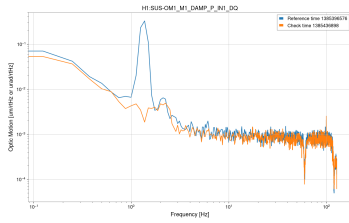
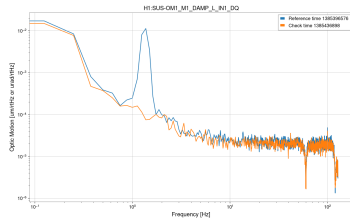
```
[ ]: myplot['RM2']
```

```
[ ]:
```



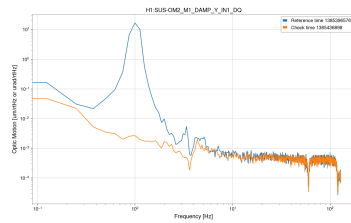
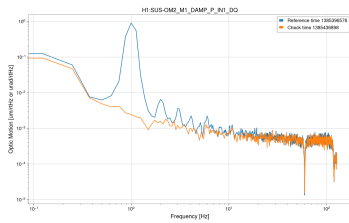
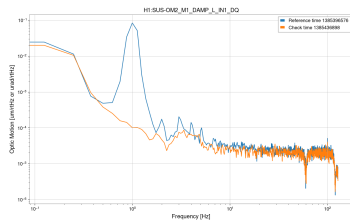
```
[ ]: myplot['OM1']
```

```
[ ]:
```



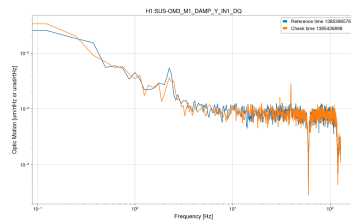
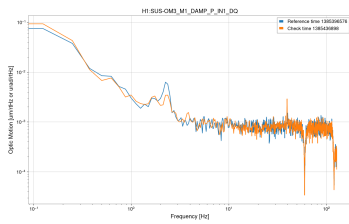
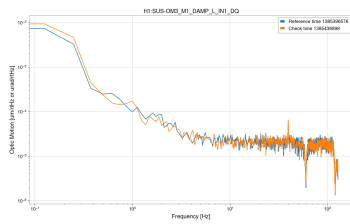
```
[ ]: myplot['OM2']
```

```
[ ]:
```



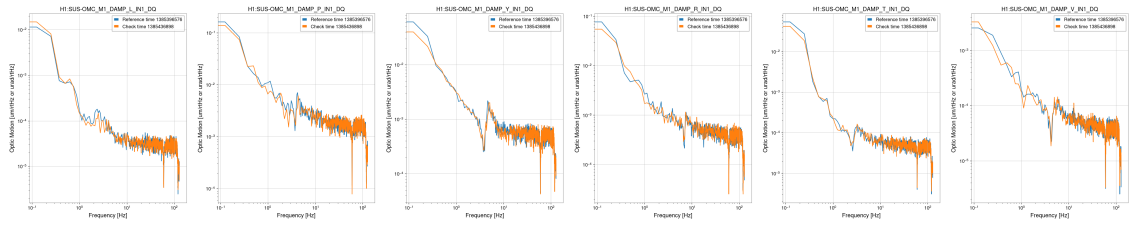
```
[ ]: myplot['OM3']
```

```
[ ]:
```



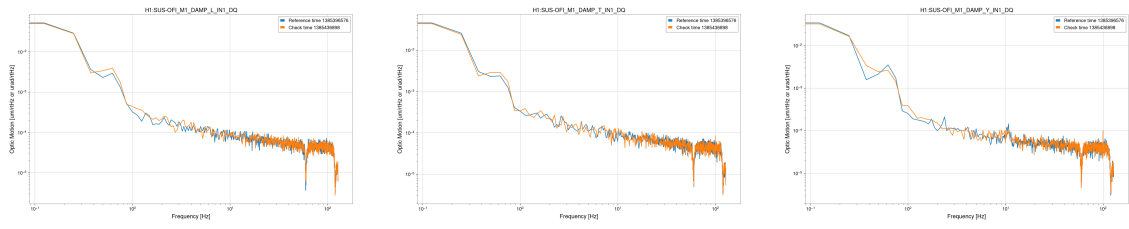
```
[ ]: myplot['OMC']
```

```
[ ]:
```



```
[ ]: myplot['OFI']
```

```
[ ]:
```



```
[ ]:
```