BS Transfer Functions and Mode Shape Plots (T1000274-v1)

Horizontal axis on all plots is log10 of frequency in Hz
Vertical axis on all plots is log10 of transfer function from structure displacement (in m or rad) to optic displacement (in m or rad)

modelcase

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20081113bsZZ
```

modelcasecomment

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Norna's BS parameter set of 11/13/08 plus intended 0.05° horizontal wedge.
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Utility stuff

- **Transfer function tables (values less than 10^-15 suppressed)**

- **Structure displacement to optic displacement TFs at different frequencies**

prettytftable[0.1]

	x out	y out	z out	yaw out	pitch out	roll out
x in	1.07257	-6.44415×10^{-11}	2.45266×10^{-9}	4.6036×10^{-6}	-0.0450474	-5.57414×10^{-10}
y in	-2.35569×10^{-10}	1.07229	8.21105×10^{-8}	-3.24374×10^{-10}	3.45833×10^{-7}	0.0369
z in	2.44311×10^{-14}	-1.51995×10^{-8}	1.00827	2.01082×10^{-13}	-6.00203×10^{-12}	-4.78625×10^{-7}
yaw in	-3.53035×10^{-7}	5.7246×10^{-8}	2.97317×10^{-15}	1.05147	-1.56418×10^{-8}	-5.48391×10^{-13}
pitch in	-0.00301974	-2.14331×10^{-13}	-6.9053×10^{-12}	-7.28212×10^{-6}	0.000126828	1.56954×10^{-12}
roll in	-8.81106×10^{-10}	0.00989934	2.67473×10^{-7}	1.67207×10^{-10}	1.29565×10^{-6}	0.138281

prettytftable[0.3]

	x out	y out	z out	yaw out	pitch out	roll out
x in	2.26725	-3.10412×10^{-7}	7.20682×10^{-8}	0.00135185	-1.32366	-7.33386×10^{-7}
y in	-3.61214×10^{-7}	2.25593	1.35768×10^{-6}	-6.05345×10^{-9}	0.0000793106	0.649232
z in	7.74184×10^{-12}	-3.41537×10^{-7}	1.07925	3.19353×10^{-12}	-8.06847×10^{-10}	-4.80977×10^{-6}
yaw in	0.0000488643	9.34006×10^{-8}	1.47543×10^{-12}	1.71672	-0.0000265116	-2.90476×10^{-11}
pitch in	-0.00638328	8.73299×10^{-10}	-2.02903×10^{-10}	-0.0000156743	0.00372668	2.0648×10^{-9}
roll in	-8.2615×10^{-8}	0.0222822	2.69244×10^{-7}	7.37526×10^{-10}	0.0000181432	0.148529

prettytftable[1]

	x out	y out	z out	yaw out	pitch out	roll out
x in	-3.54143	-0.000015022	-1.62203×10^{-8}	0.0642168	0.29124	0.0000522161
y in	-0.0000219834	-3.54556	2.00991×10^{-6}	4.13915×10^{-7}	0.000908296	0.419702
z in	1.15759×10^{-8}	0.0000224348	4.38842	-2.18868×10^{-10}	-4.37826×10^{-7}	-0.000284289
yaw in	-0.000264836	-5.70586×10^{-8}	-2.56668×10^{-11}	-0.85814	0.000458103	3.57911×10^{-8}
pitch in	0.00997066	4.22938×10^{-8}	4.56673×10^{-11}	-0.000174865	-0.000819969	-1.47011×10^{-7}
roll in	-0.0000110942	-0.0474428	-6.87587×10^{-7}	2.08897×10^{-7}	0.000458254	0.212008

prettytftable[3]

	x out	y out	z out	yaw out	pitch out	roll out
x in	-0.00133681	-1.12278×10^{-8}	8.44152×10^{-11}	-0.000139829	-0.00152964	9.94156×10^{-8}
y in	-4.21803×10^{-8}	0.00274306	-1.10036×10^{-6}	-1.3778×10^{-8}	-0.000543424	1.16292
z in	-3.79867×10^{-12}	6.31172×10^{-7}	-0.387426	-4.91628×10^{-12}	-5.58797×10^{-8}	0.000123742
yaw in	4.80676×10^{-7}	-4.03793×10^{-10}	-1.1991×10^{-15}	-0.00740931	1.10083×10^{-7}	7.25035×10^{-12}
pitch in	3.76368×10^{-6}	3.16139×10^{-11}	-2.37662×10^{-13}	4.44901×10^{-7}	4.30659×10^{-6}	-2.79891×10^{-10}
roll in	2.0155×10^{-8}	-0.00195118	5.79873×10^{-7}	6.49552×10^{-9}	0.000259665	-0.55568

prettytftable[10]

	x out	y out	z out	yaw out	pitch out	roll out
x in	-5.95392×10^{-7}	7.13492×10^{-14}	-3.86859×10^{-13}	-3.13956×10^{-8}	-6.49299×10^{-7}	1.87581×10^{-8}
y in	2.71593×10^{-12}	-1.19202×10^{-6}	6.45987×10^{-8}	2.7092×10^{-11}	1.33343×10^{-6}	-0.00313971
z in	1.19781×10^{-14}	2.25427×10^{-10}	0.00394333	-6.0336×10^{-14}	-2.94276×10^{-9}	6.8901×10^{-6}
yaw in	1.35556×10^{-10}	-1.19831×10^{-13}	0	-2.19955×10^{-6}	3.68746×10^{-11}	2.13543×10^{-14}
pitch in	1.67628×10^{-9}	0	1.08914×10^{-15}	1.03598×10^{-10}	1.82806×10^{-9}	-5.28122×10^{-11}
roll in	-9.01882×10^{-13}	1.94994×10^{-7}	-2.18156×10^{-8}	-9.01054×10^{-12}	-4.42797×10^{-7}	0.00104262

prettytftable[30]

	x out	y out	z out	yaw out	pitch out	roll out
x in	-7.86751×10^{-10}	0	-3.10015×10^{-14}	-3.97077×10^{-11}	-8.54532×10^{-10}	-3.31351×10^{-10}
y in	-3.63937×10^{-14}	-1.50772×10^{-9}	5.0563×10^{-9}	-4.64042×10^{-13}	-2.26441×10^{-8}	0.0000537276
z in	0	2.29403×10^{-13}	-0.0000143857	-2.2662×10^{-15}	-1.10929×10^{-10}	2.63342×10^{-7}
yaw in	1.74202×10^{-13}	0	0	-2.83988×10^{-9}	4.78677×10^{-14}	0
pitch in	2.21504×10^{-12}	0	0	1.31427×10^{-13}	2.40588×10^{-12}	9.32896×10^{-13}
roll in	1.18822×10^{-14}	2.31126×10^{-10}	-1.64953×10^{-9}	1.51488×10^{-13}	7.39309×10^{-9}	-0.0000175415

prettytftable[100]

	x out	y out	z out	yaw out	pitch out	roll out
x in	-5.71135×10^{-13}	0	0	-2.86852×10^{-14}	-6.20135×10^{-13}	-8.66906×10^{-1}
y in	0	-1.07455×10^{-12}	9.23396×10^{-13}	0	-5.89977×10^{-12}	1.40104×10^{-8}
z in	0	0	-6.9859×10^{-9}	0	-1.87798×10^{-14}	4.46657×10^{-11}
yaw in	0	0	0	-2.05631×10^{-12}	0	0
pitch in	1.60799×10^{-15}	0	0	0	1.74595×10^{-15}	0
roll in	0	1.60954×10^{-13}	-3.00294×10^{-13}	0	1.92267×10^{-12}	-4.56584×10^{-9}

■ Top mass force TFs

prettytfftable[0.01]

	x out	y out	z out	yaw out	pitch out	roll out
x in	0.00153012	-1.44444×10^{-15}	8.8897×10^{-12}	-7.21434×10^{-8}	-0.000163274	-3.81507×10^{-15}
y in	-1.01378×10^{-14}	0.00152918	9.69946×10^{-10}	2.38933×10^{-13}	2.48354×10^{-11}	0.000281872
z in	0	4.56536×10^{-10}	0.000347472	0	0	-2.30147×10^{-10}
yaw in	-4.03214×10^{-7}	8.29119×10^{-9}	-3.88771×10^{-14}	0.152283	7.20486×10^{-7}	-1.37016×10^{-14}
pitch in	-0.00351411	-2.81637×10^{-12}	-8.85624×10^{-9}	-6.10953×10^{-6}	0.16266	3.67784×10^{-12}
roll in	-2.09164×10^{-13}	0.00127975	9.53837×10^{-9}	5.03552×10^{-12}	5.11652×10^{-10}	0.00580732

prettytfftable[0.03]

	x out	y out	z out	yaw out	pitch out	roll out
x in	0.00153854	5.24579×10^{-14}	9.20147×10^{-12}	-7.24324×10^{-8}	-0.000169001	1.03034×10^{-13}
y in	-1.13853×10^{-13}	0.00153757	9.79592×10^{-10}	2.09599×10^{-13}	2.33083×10^{-10}	0.000286224
z in	0	4.58637×10^{-10}	0.0003477	0	0	-2.42099×10^{-10}
yaw in	-3.82375×10^{-7}	8.32397×10^{-9}	-3.9045×10^{-14}	0.152885	7.23986×10^{-7}	-1.9133×10^{-14}
pitch in	-0.00353861	-5.67985×10^{-11}	-8.89763×10^{-9}	-6.12971×10^{-6}	0.16342	-1.06976×10^{-10}
roll in	-2.31185×10^{-12}	0.00128704	9.54127×10^{-9}	5.17286×10^{-12}	4.73323×10^{-9}	0.00581261

prettytfftable[0.1]

	x out	y out	z out	yaw out	pitch out	roll out
x in	0.00164011	3.95643×10^{-13}	1.3133×10^{-11}	-6.88251×10^{-8}	-0.000241211	-2.92642×10^{-1}
y in	-2.15925×10^{-12}	0.00163878	1.09529×10^{-9}	-1.47139×10^{-13}	3.1743×10^{-9}	0.000338768
z in	0	4.83828×10^{-10}	0.000350315	0	-3.78262×10^{-15}	-3.78965×10^{-1}
yaw in	-1.19712×10^{-7}	8.71326×10^{-9}	-4.05241×10^{-14}	0.160041	7.56647×10^{-7}	-8.10092×10^{-1}
pitch in	-0.0038373	-4.98429×10^{-10}	-9.39136×10^{-9}	-6.38518×10^{-6}	0.172488	-5.57821×10^{-1}
roll in	-3.74386×10^{-11}	0.00137504	9.5787×10^{-9}	6.79715×10^{-12}	5.50519×10^{-8}	0.0058755

prettytfftable[0.3]

	x out	y out	z out	yaw out	pitch out	roll out
x in	0.00346882	-5.30453×10^{-10}	1.26761×10^{-10}	1.94368×10^{-6}	-0.0023282	-1.25751×10^{-9}
y in	-7.14336×10^{-10}	0.00345072	3.0541×10^{-9}	-7.62703×10^{-12}	1.56852×10^{-7}	0.001284
z in	2.64933×10^{-15}	9.07925×10^{-10}	0.000374979	1.70087×10^{-15}	-2.72602×10^{-13}	-1.61213×10^{-9}
yaw in	7.28979×10^{-6}	1.42165×10^{-8}	1.47843×10^{-13}	0.261298	-2.61913×10^{-6}	-3.77389×10^{-12}
pitch in	-0.00999282	5.68922×10^{-8}	-1.6817×10^{-8}	-0.0000156139	0.308873	1.38679×10^{-7}
roll in	-3.81292×10^{-9}	0.00295438	1.06653×10^{-8}	2.57959×10^{-11}	8.37345×10^{-7}	0.00685489

prettytfftable[1]

	x out	y out	z out	yaw out	pitch out	roll out
x in	-0.0054316	-4.82831×10^{-8}	-8.9805×10^{-11}	0.0000985814	0.00162641	1.68314×10^{-7}
y in	-5.58924×10^{-8}	-0.0054488	3.47088×10^{-9}	1.05239×10^{-9}	2.30907×10^{-6}	0.0010675
z in	4.03009×10^{-12}	6.20203×10^{-9}	0.00152473	-7.64946×10^{-14}	-1.52455×10^{-10}	-9.8929×10^{-8}
yaw in	-0.0000400209	-8.57274×10^{-9}	-3.6189×10^{-12}	-0.130615	0.0000645256	5.05623×10^{-9}
pitch in	0.0289223	0.0000253661	6.50598×10^{-8}	-0.000547534	-1.18211	-0.0000886555
roll in	-4.88361×10^{-7}	-0.00516817	-3.50739×10^{-8}	9.1955×10^{-9}	0.0000201724	0.00933214

prettytfftable[3]

	x out	y out	z out	yaw out	pitch out	roll out
x in	-2.04023×10^{-6}	-1.58113×10^{-11}	1.19831×10^{-13}	-2.12938×10^{-7}	-2.1718×10^{-6}	1.39859×10^{-10}
y in	-2.24082×10^{-11}	1.4617×10^{-7}	-6.36698×10^{-10}	-7.49978×10^{-12}	-2.88694×10^{-7}	0.0006178
z in	-1.37324×10^{-15}	2.23835×10^{-10}	-0.000134609	-1.728×10^{-15}	-2.01032×10^{-11}	4.44658×10^{-8}
yaw in	7.32274×10^{-8}	-6.14657×10^{-11}	0	-0.00112775	1.61157×10^{-8}	1.13107×10^{-12}
pitch in	8.45848×10^{-7}	-1.31743×10^{-9}	8.94774×10^{-12}	2.00739×10^{-7}	-0.000161758	1.18069×10^{-8}
roll in	8.13945×10^{-10}	-0.0000799929	2.42086×10^{-8}	2.62152×10^{-10}	0.0000104864	-0.0224407

prettytfftable[10]

	x out	y out	z out	yaw out	pitch out	roll out
x in	-9.08857×10^{-10}	0	0	-4.77828×10^{-11}	-9.08707×10^{-10}	2.59768×10^{-11}
y in	2.25322×10^{-15}	-1.40007×10^{-9}	5.4505×10^{-11}	2.24475×10^{-14}	1.10625×10^{-9}	-2.60478×10^{-6}
z in	0	7.74369×10^{-14}	1.37009×10^{-6}	0	-1.02108×10^{-12}	2.39071×10^{-9}
yaw in	2.06623×10^{-11}	-1.82391×10^{-14}	0	-3.34788×10^{-7}	5.28319×10^{-12}	1.40133×10^{-14}
pitch in	5.48479×10^{-10}	1.02751×10^{-14}	-5.49434×10^{-14}	5.88835×10^{-11}	-8.18387×10^{-8}	2.6399×10^{-9}
roll in	-3.56826×10^{-14}	7.17521×10^{-9}	-8.71126×10^{-10}	-3.56536×10^{-13}	-1.75191×10^{-8}	0.0000412507

prettytfftable[30]

	x out	y out	z out	yaw out	pitch out	roll out
x in	-1.20098×10^{-12}	0	0	-6.04302×10^{-14}	-1.19464×10^{-12}	-4.5828×10^{-13}
y in	0	-1.80262×10^{-12}	4.24924×10^{-12}	0	-1.90449×10^{-11}	4.51878×10^{-8}
z in	0	0	-4.99822×10^{-9}	0	-3.85646×10^{-14}	9.15509×10^{-11}
yaw in	2.65541×10^{-14}	0	0	-4.3225×10^{-10}	6.84661×10^{-15}	0
pitch in	7.41303×10^{-13}	0	-4.41839×10^{-15}	7.57897×10^{-14}	-1.09004×10^{-10}	-4.72164×10^{-1}
roll in	0	8.42014×10^{-12}	-6.51581×10^{-11}	5.98654×10^{-15}	2.92165×10^{-10}	-6.93217×10^{-7}

prettytfftable[100]

	x out	y out	z out	yaw out	pitch out	roll out
x in	0	0	0	0	0	0
y in	0	-1.29245×10^{-15}	0	0	-4.96929×10^{-15}	1.18008×10^{-11}
z in	0	0	-2.42721×10^{-12}	0	0	1.5533×10^{-14}
yaw in	0	0	0	-3.12986×10^{-13}	0	0
pitch in	0	0	0	0	-7.92114×10^{-14}	-1.23703×10^{-14}
roll in	0	5.84178×10^{-15}	-1.18515×10^{-14}	0	7.59715×10^{-14}	-1.80413×10^{-10}

■ Mode shape listings/plots

#1

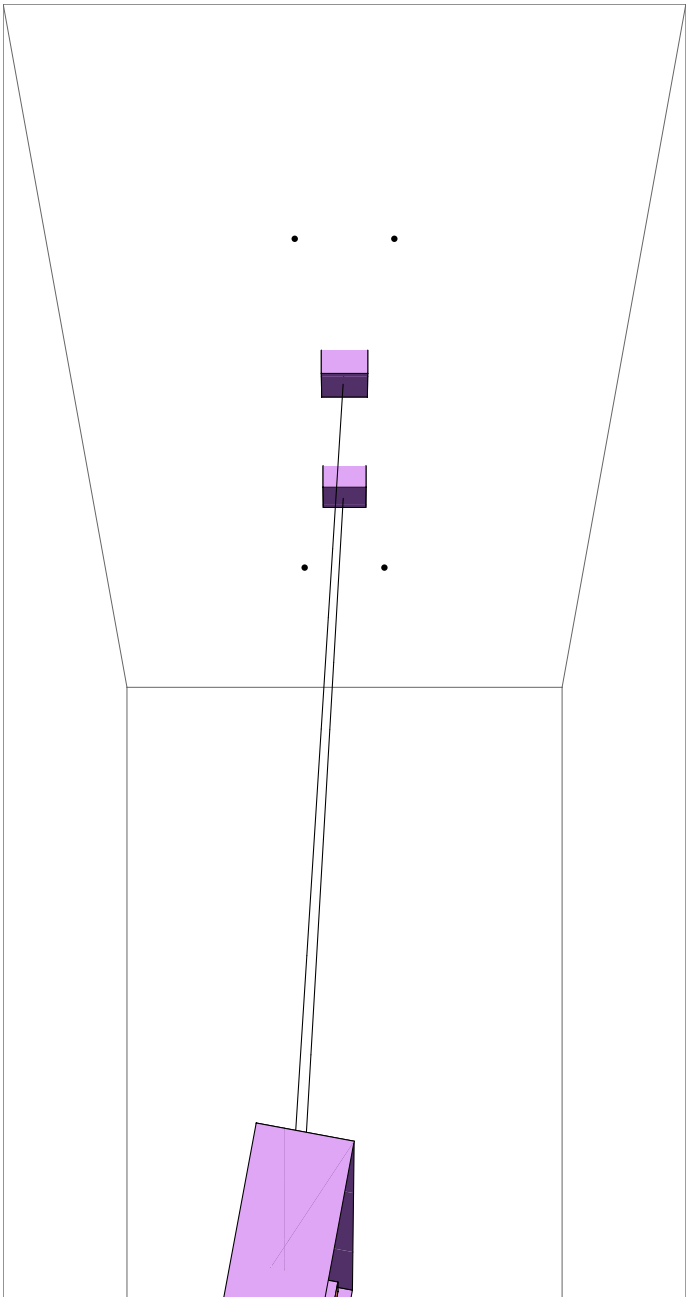
Hz2[[-1]]

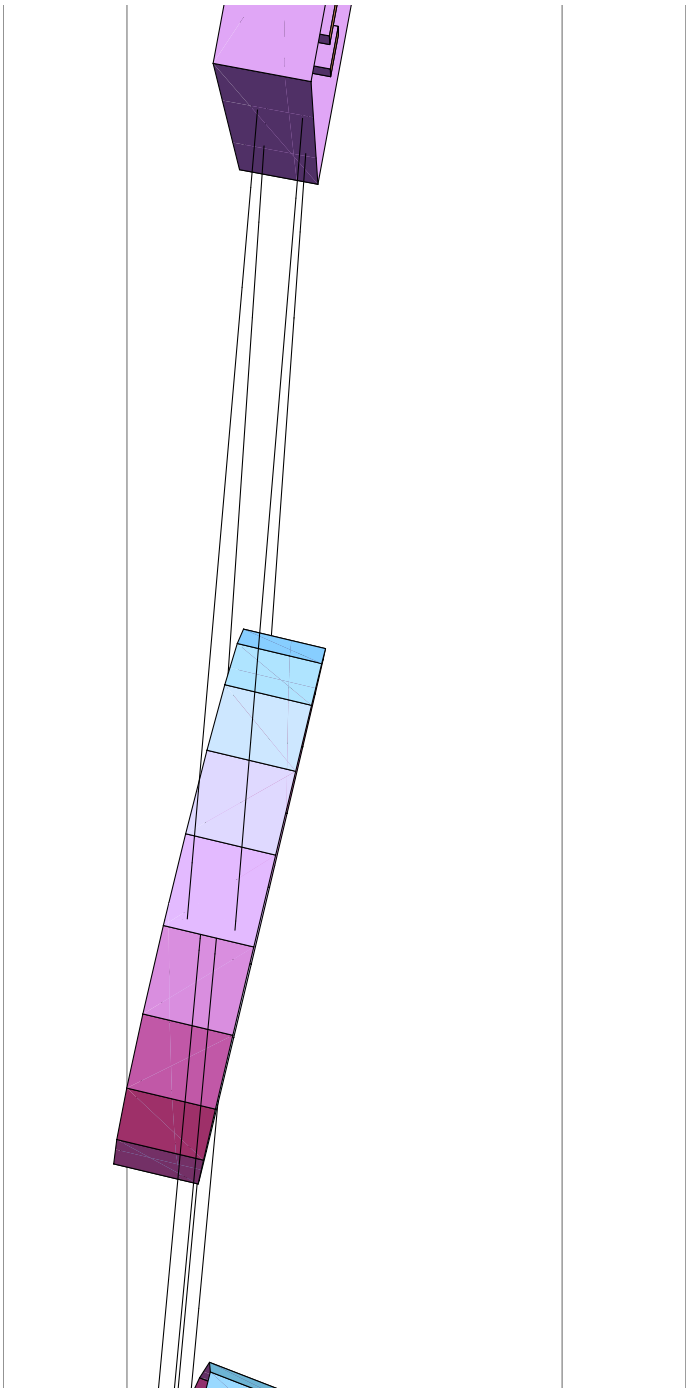
0.419706

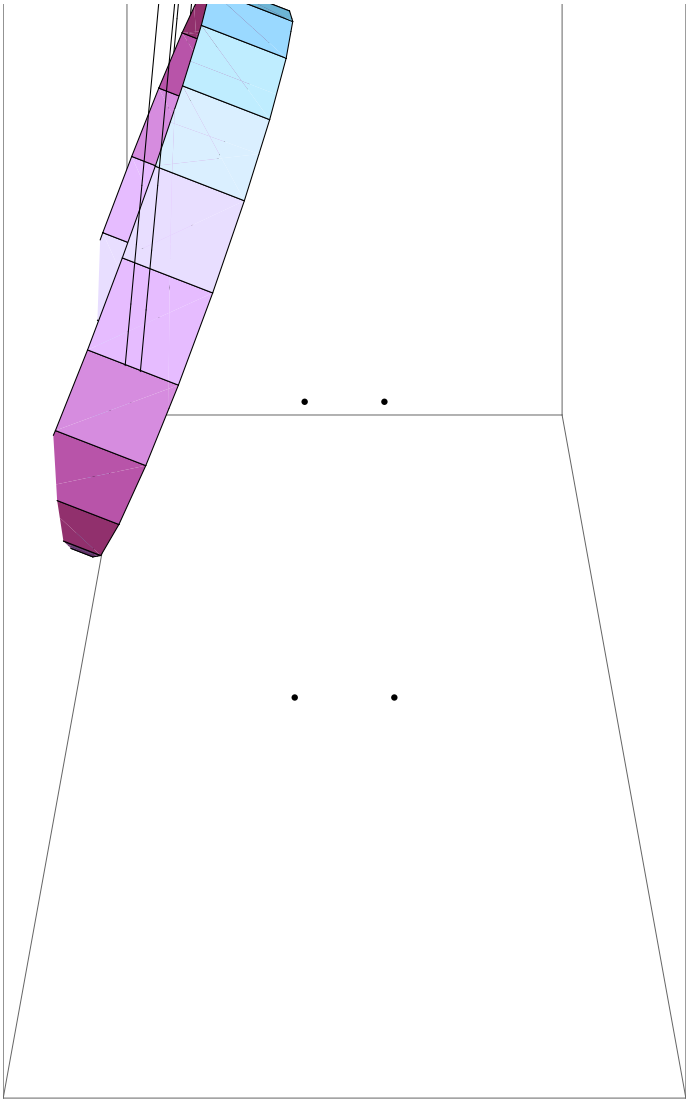
pretty[Chop[e2ni.eigenvectors2[[-1]], 10^-4]]

	x	y	z	yaw	pitch	roll
Mass U	-0.0732178	0	0	-0.00066446	0.367851	0
Mass I	-0.166799	0	0	-0.00131729	0.466374	0
optic	-0.259632	0	0	-0.00143551	0.739314	0

```
DoWithStatus["Plotting stage 2 mode 1",
 eigenplot[eigenvectors2[[-1]], 0.5, {0, -1, 0}, floatmatrix2]]
```







#2

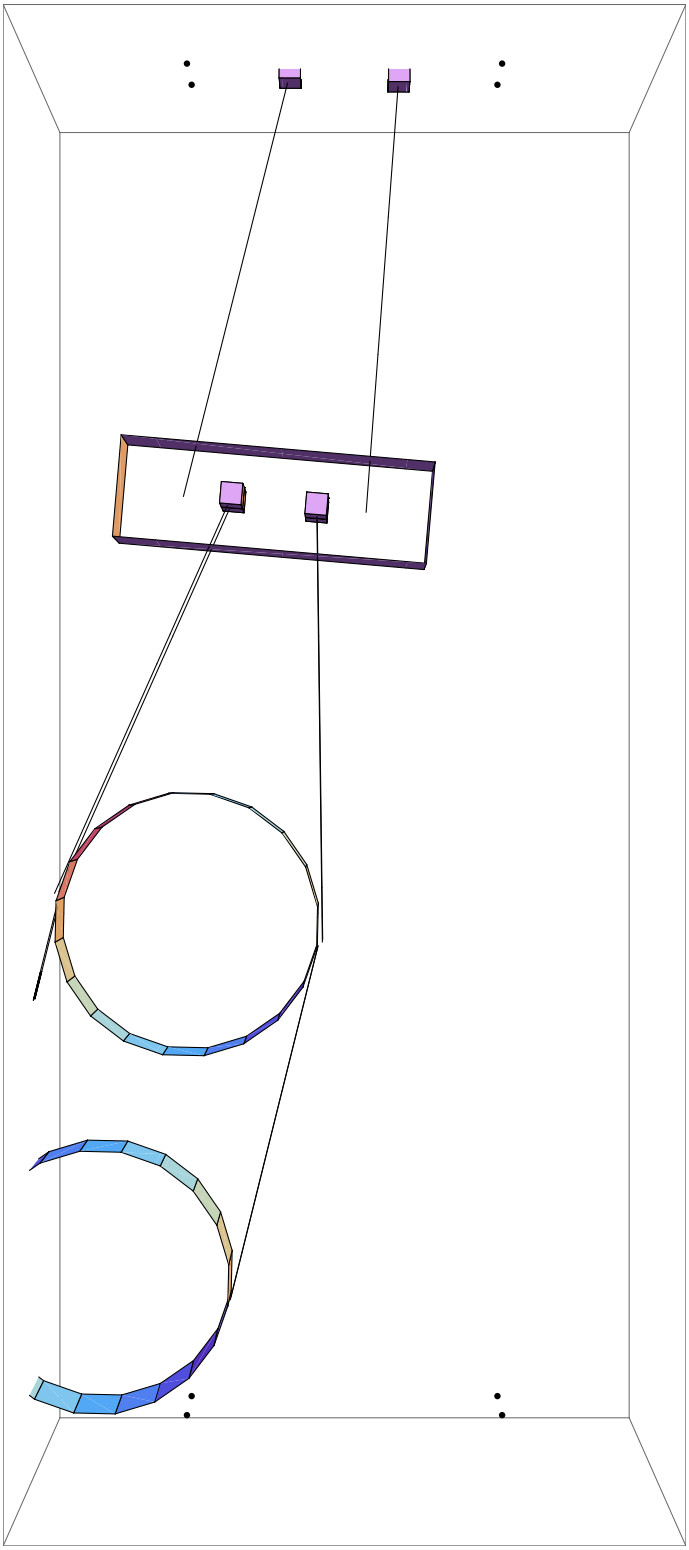
Hz2[[-2]]

0.422915

pretty[Chop[e2ni.eigenvectors2[[-2]], 10^-4]]

	x	y	z	yaw	pitch	roll
Mass U	0	0.19752	0	0	0	0.172635
Mass I	0	0.442096	0	0	0	0.360095
optic	0	0.6901	0	0	0	0.360315

```
DoWithStatus["Plotting stage 2 mode 2",
 eigenplot[eigenvectors2[[-2]], 0.5, {-1, 0, 0}, floatmatrix2]]
```



#3

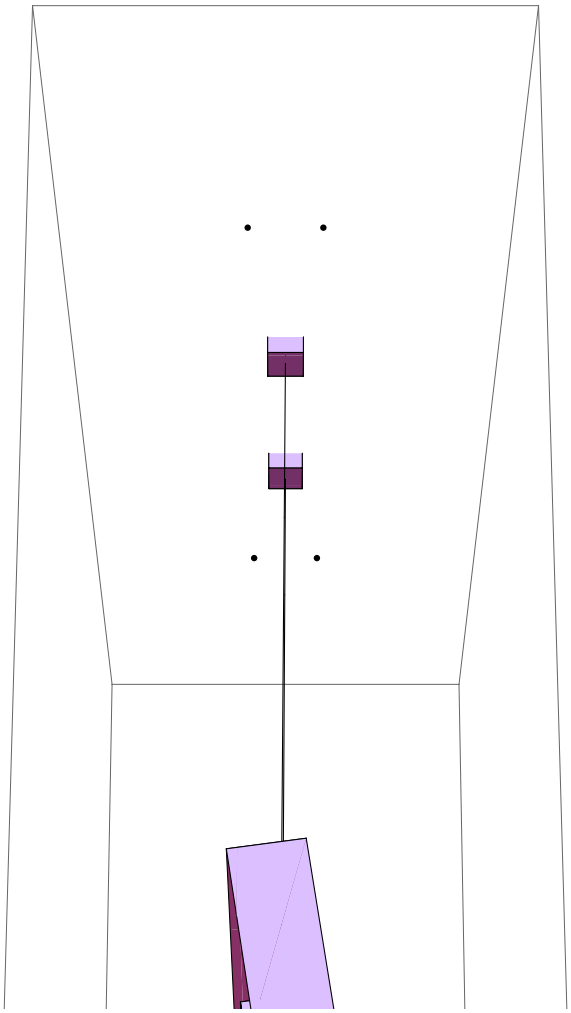
```
Hz2[[-3]]
```

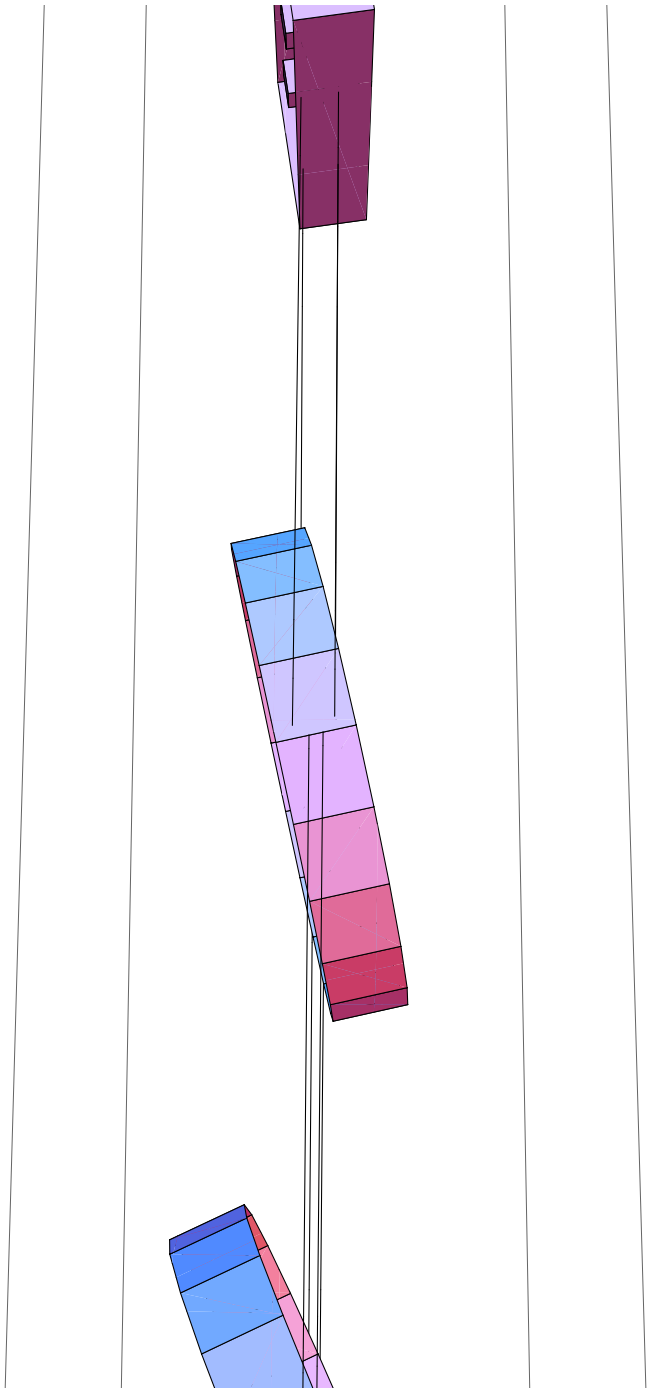
```
0.487545
```

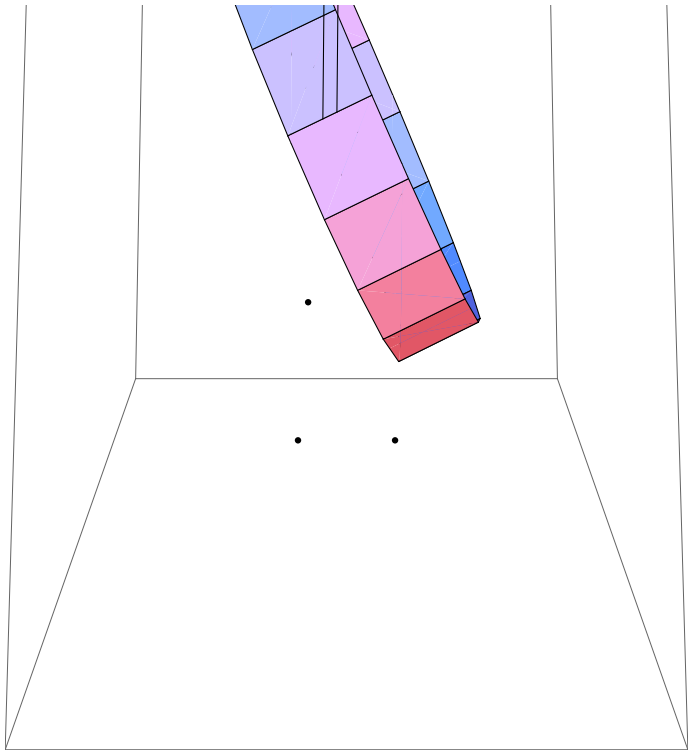
```
pretty[Chop[e2ni.eigenvectors2[[-3]], 10^-4]]
```

```
       x           y  z  yaw          pitch      roll
Mass U -0.00745616 0  0  -0.00358297 -0.287721  0
Mass I -0.0118546  0  0  -0.00682805 -0.429803  0
optic  -0.0201797  0  0  -0.00778821 -0.855431  0
```

```
DoWithStatus["Plotting stage 2 mode 3",
 eigenplot[eigenvectors2[[-3]], .5, {0, -1, -.25}, floatmatrix2]]
```







#4

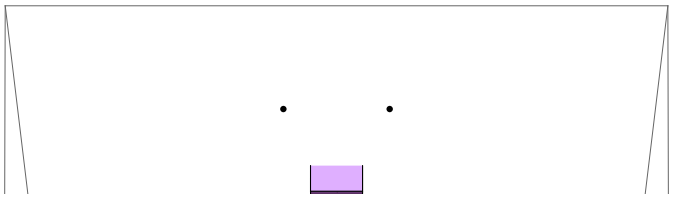
```
Hz2[[-4]]
```

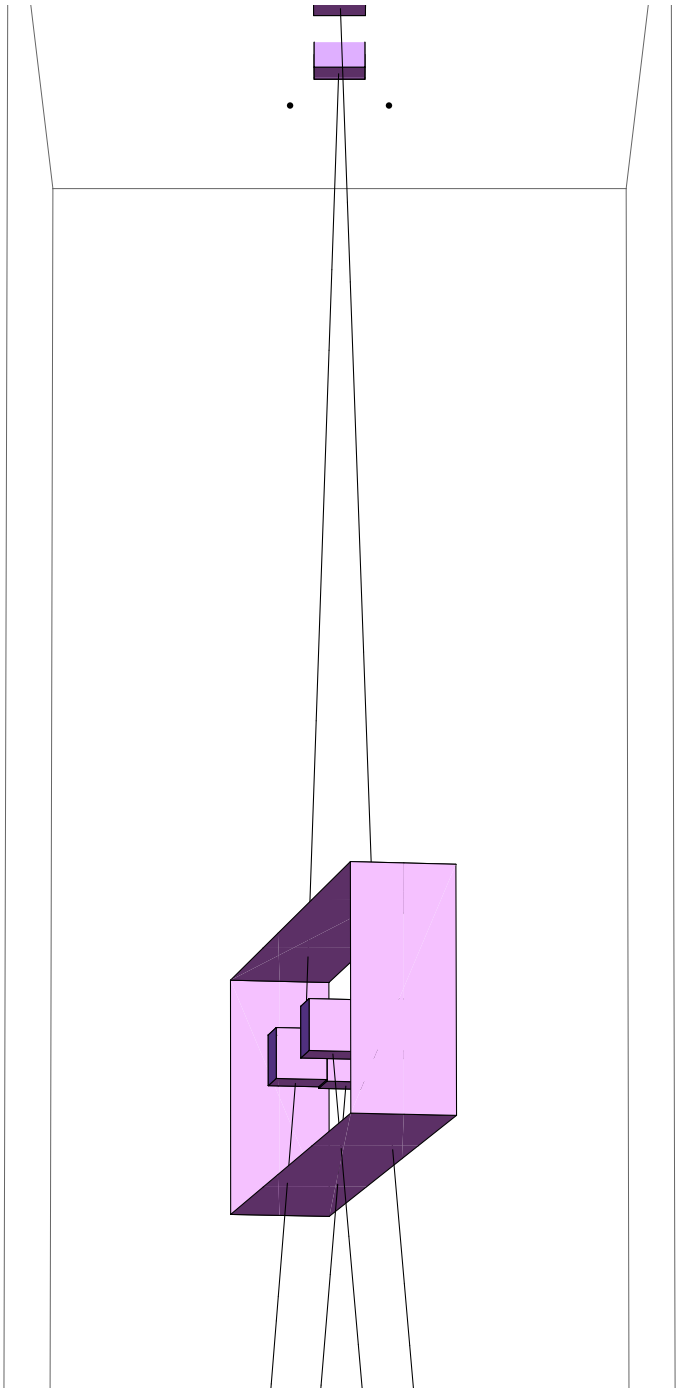
0.489263

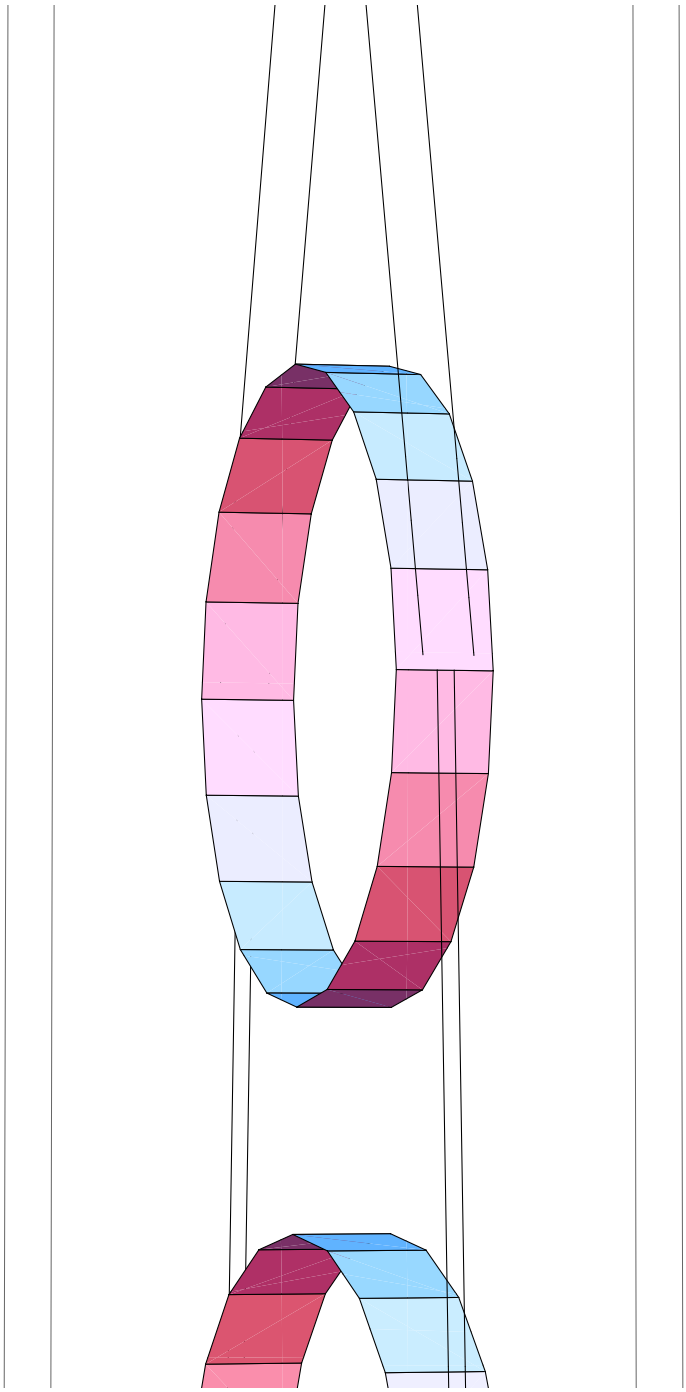
```
pretty[Chop[e2ni.eigenvectors2[[-4]], 10^-4]]
```

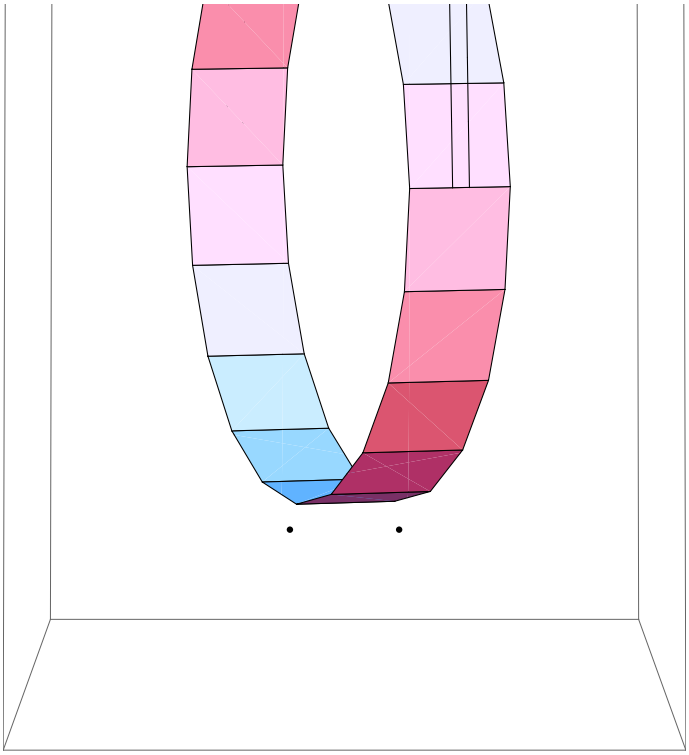
	x	y	z	yaw	pitch	roll
Mass U	-0.000115437	0	0	0.327303	-0.0032718	0
Mass I	-0.00020171	0	0	0.623393	-0.00489639	0
optic	-0.000298315	0	0	0.710016	-0.0098077	0

```
DoWithStatus["Plotting stage 2 mode 4",
 eigenplot[eigenvectors2[[-4]], .5, {0, -3, -.25}, floatmatrix2]]
```









#5

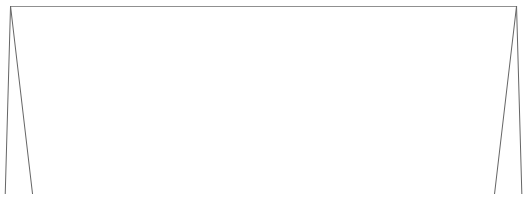
```
Hz2[[-5]]
```

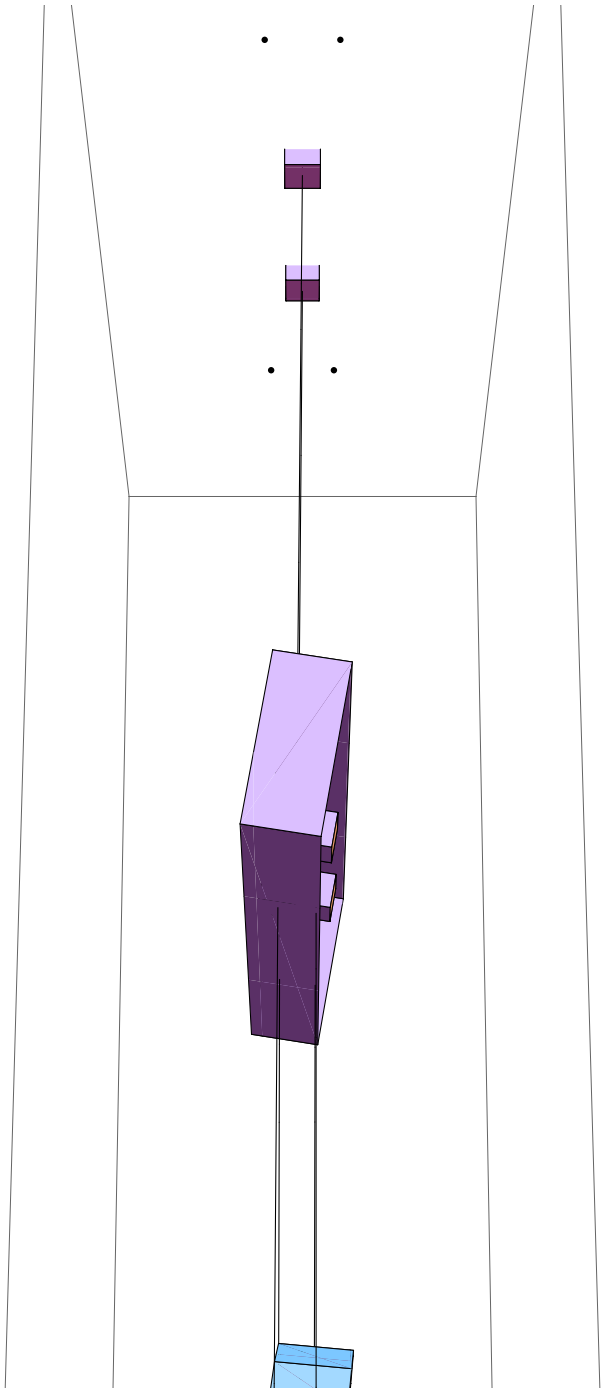
```
1.04177
```

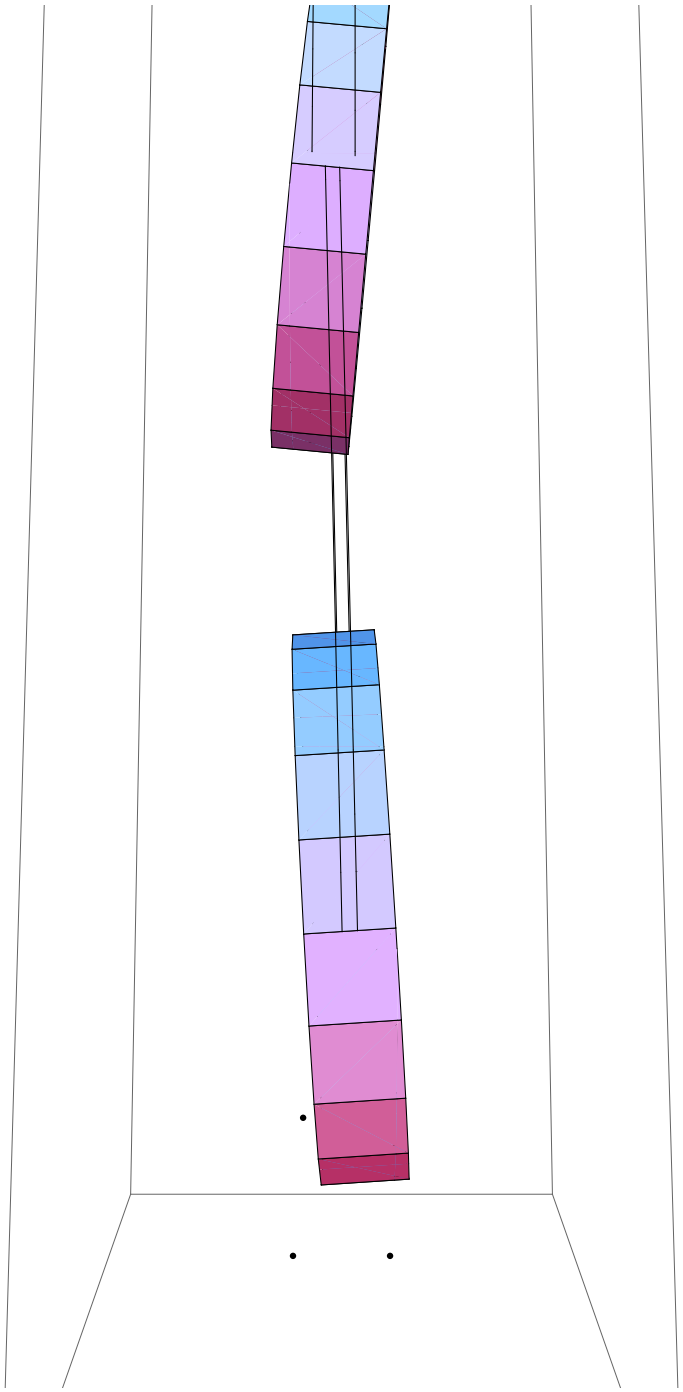
```
pretty[Chop[e2ni.eigenvectors2[[-5]], 10^-4]]
```

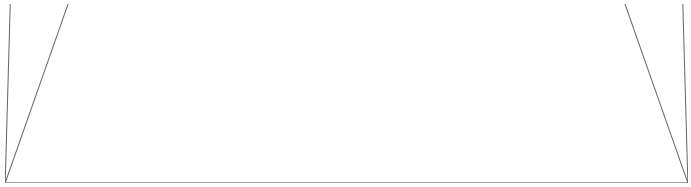
```
       x           y  z  yaw          pitch      roll
Mass U 0.02166     0  0  0.000237617 -0.827523  0
Mass I 0.0313456   0  0  0.000230292 -0.469474  0
optic  -0.0268338  0  0  0.000533427 0.304348   0
```

```
DoWithStatus["Plotting stage 2 mode 5",
 eigenplot[eigenvectors2[[-5]], -0.2, {0, -1, -0.25}, floatmatrix2]]
```









#6

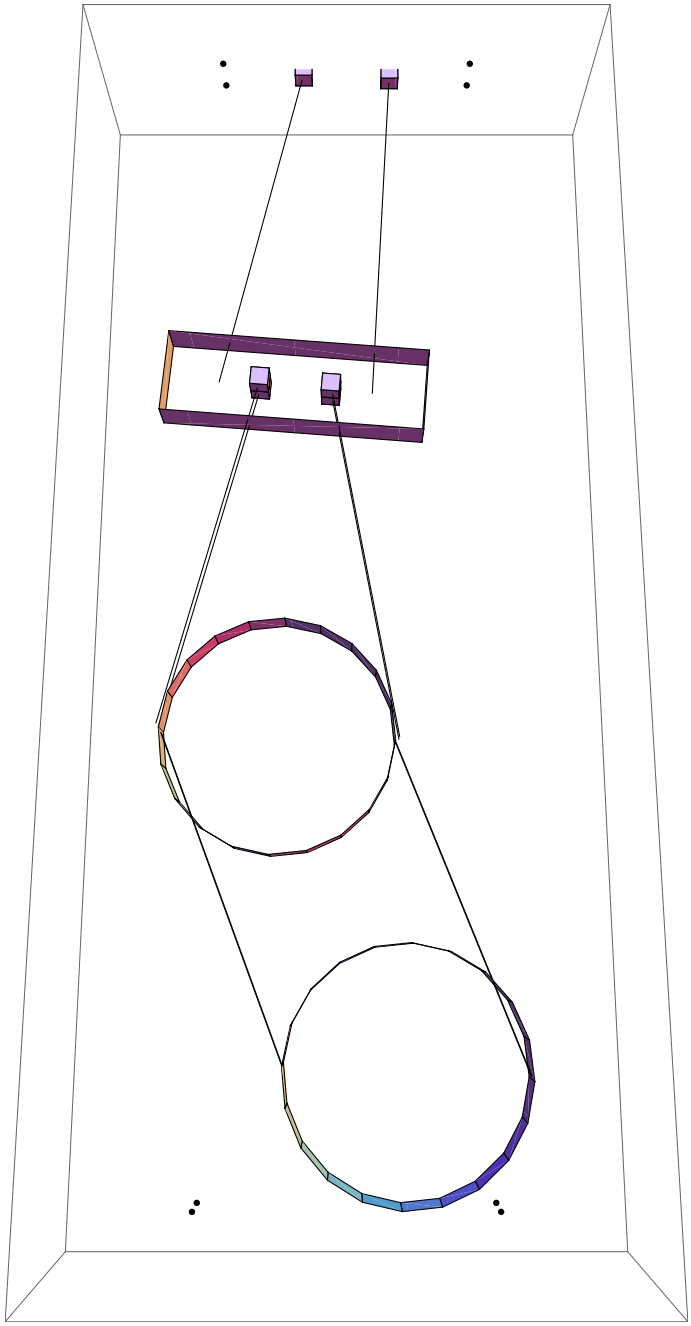
Hz2[[-6]]

1.05014

pretty[Chop[e2ni.eigenvectors2[[-6]], 10^-4]]

	x	y	z	yaw	pitch	roll
Mass U	0.000441357	-0.42954	0	0	-0.0031505	-0.403791
Mass I	0.000554776	-0.541855	0	0	-0.00144308	-0.280317
optic	-0.000459061	0.448505	0	0	0.00103833	-0.281234

```
DoWithStatus["Plotting stage 2 mode 6",
 eigenplot[eigenvectors2[[-6]], -.2, {-1, 0, -.25}, floatmatrix2]]
```



#7

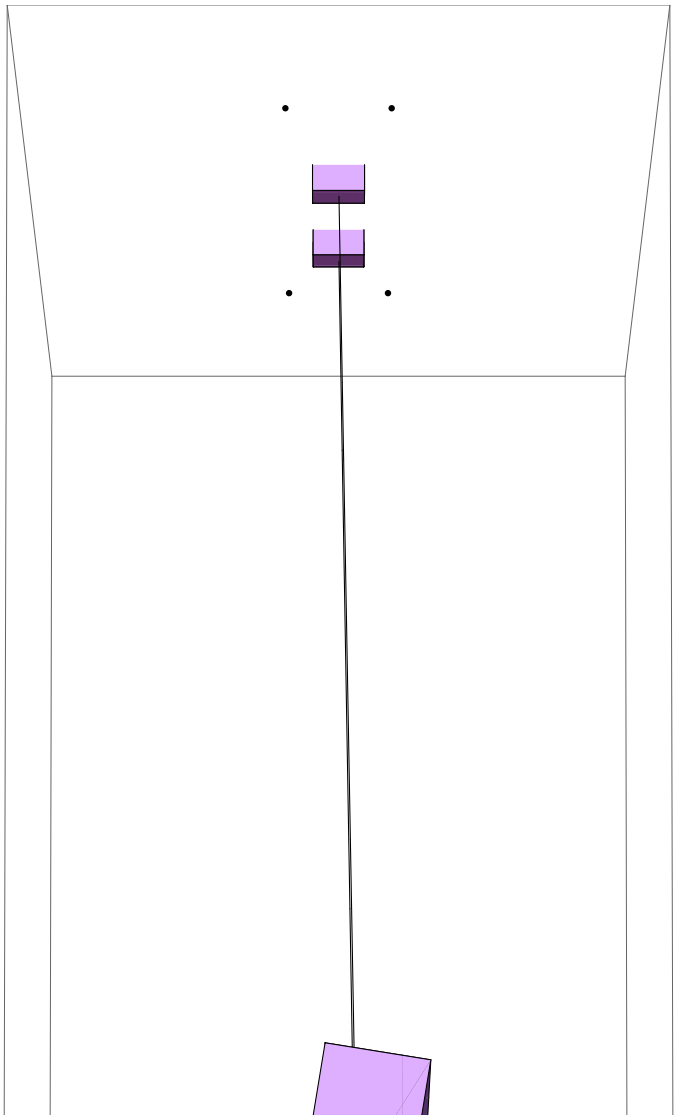
```
Hz2[[-7]]
```

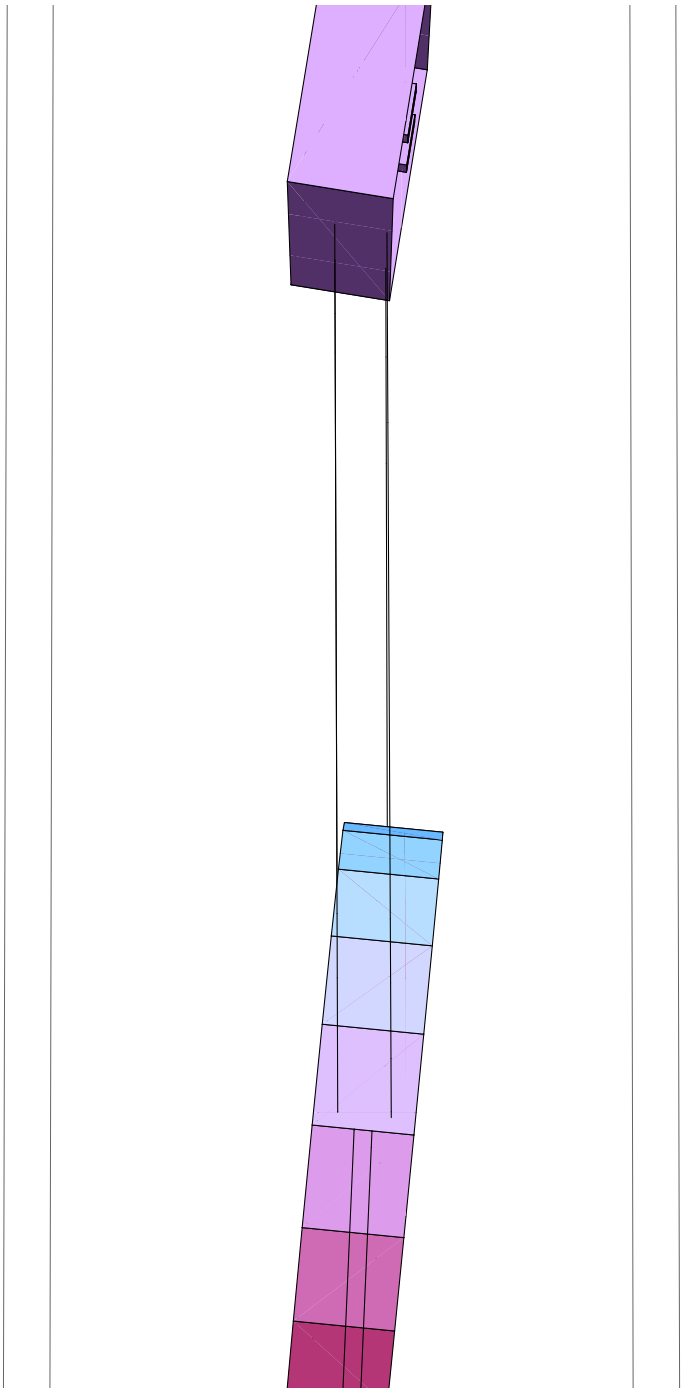
1.05737

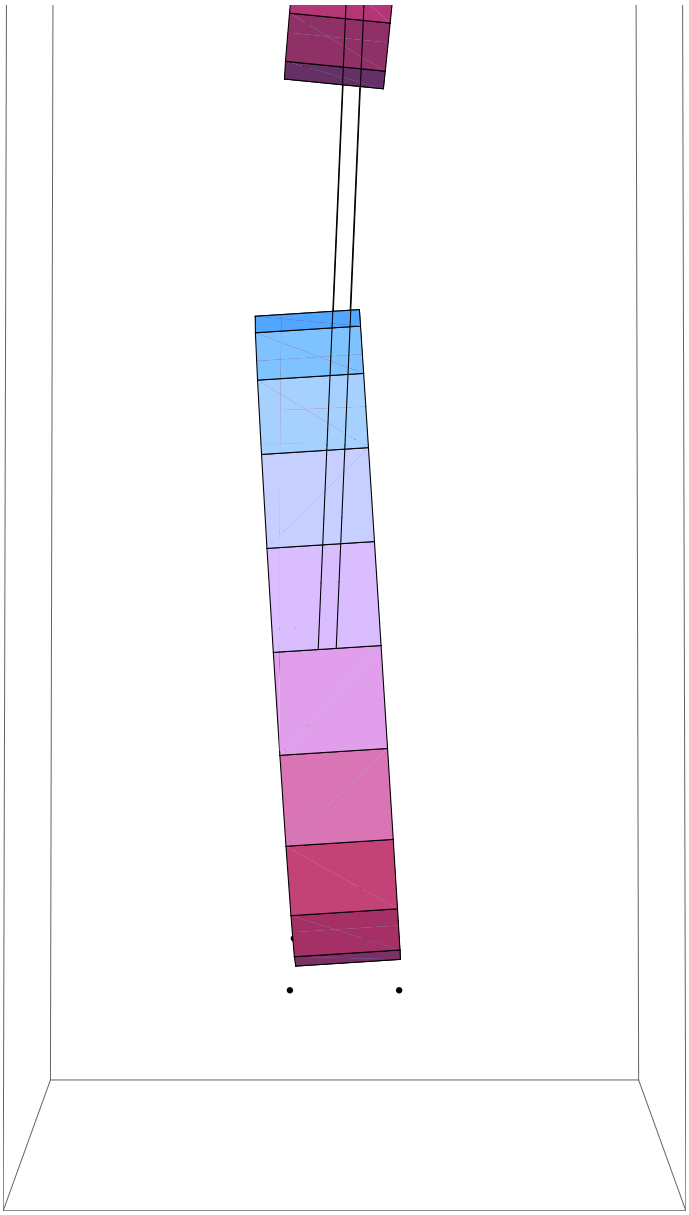
```
pretty[Chop[e2ni.eigenvectors2[[-7]], 10^-4]]
```

	x	y	z	yaw	pitch	roll
Mass U	-0.0533213	0	0	-0.000500291	-0.806819	0
Mass I	-0.0599928	0	0	-0.000430001	-0.490072	0
optic	0.048245	0	0	-0.000967751	0.316388	0

```
DoWithStatus["Plotting stage 2 mode 7",
 eigenplot[eigenvectors2[[-7]], -0.2, {0, -3, -0.25}, floatmatrix2]]
```







#8

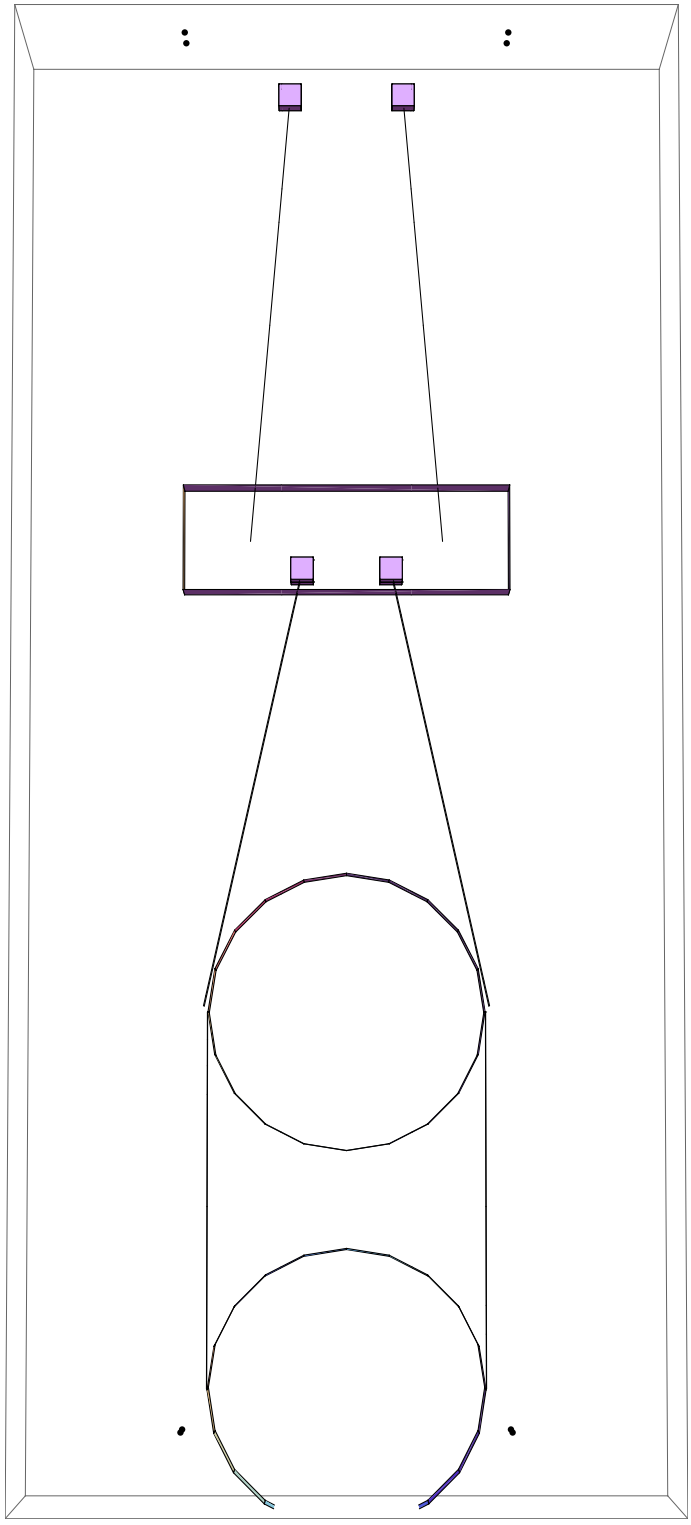
Hz2[[-8]]

1.14956

pretty[Chop[e2ni.eigenvectors2[[-8]], 10^-4]]

	x	y	z	yaw	pitch	roll
Mass U	0	0	0.418724	0	0	0
Mass I	0	0	0.639262	0	0	0
optic	0	0	0.644991	0	0	0

```
DoWithStatus["Plotting stage 2 mode 8",
 eigenplot[eigenvectors2[[-8]], -.2, {-3, 0, -.25}, floatmatrix2]]
```



#9

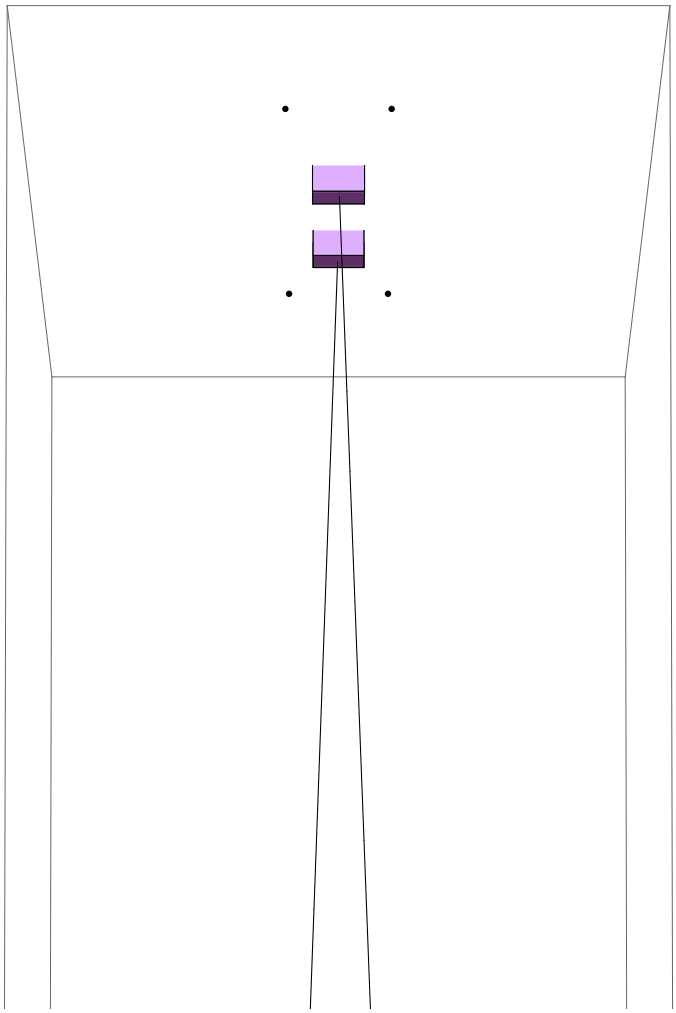
```
Hz2[[-9]]
```

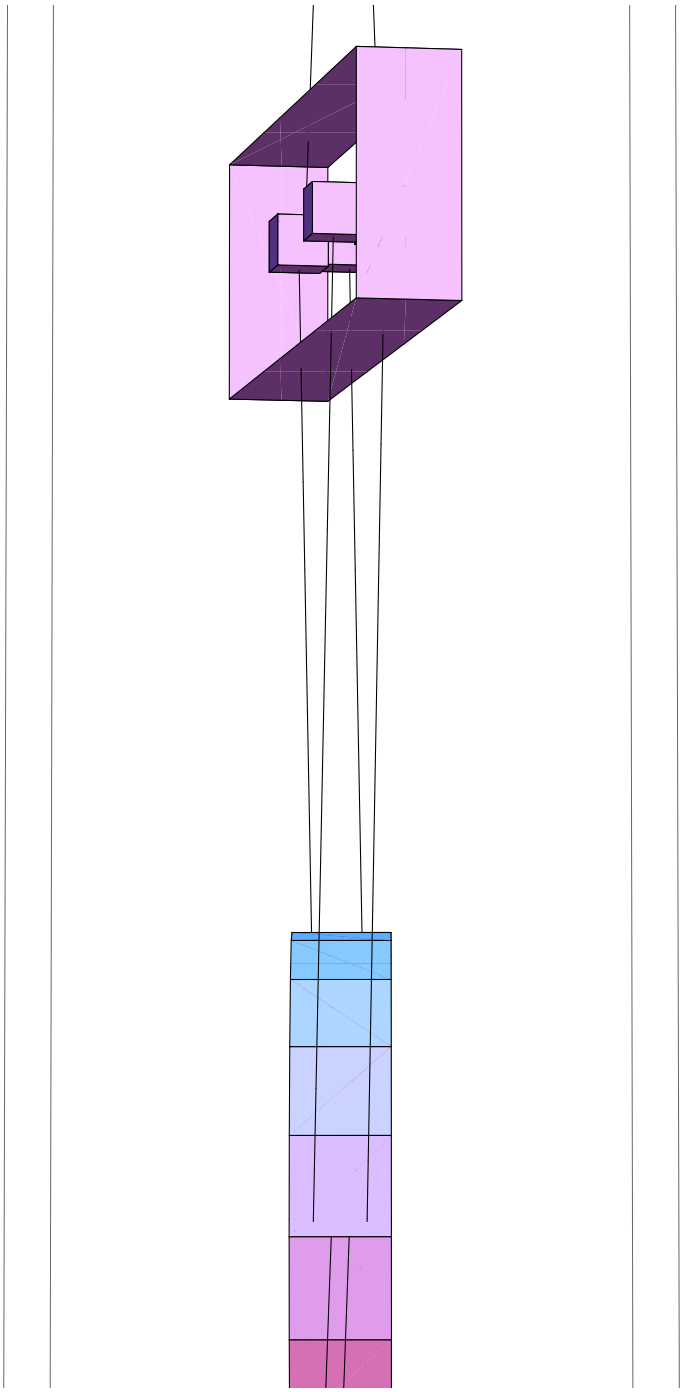
```
1.37369
```

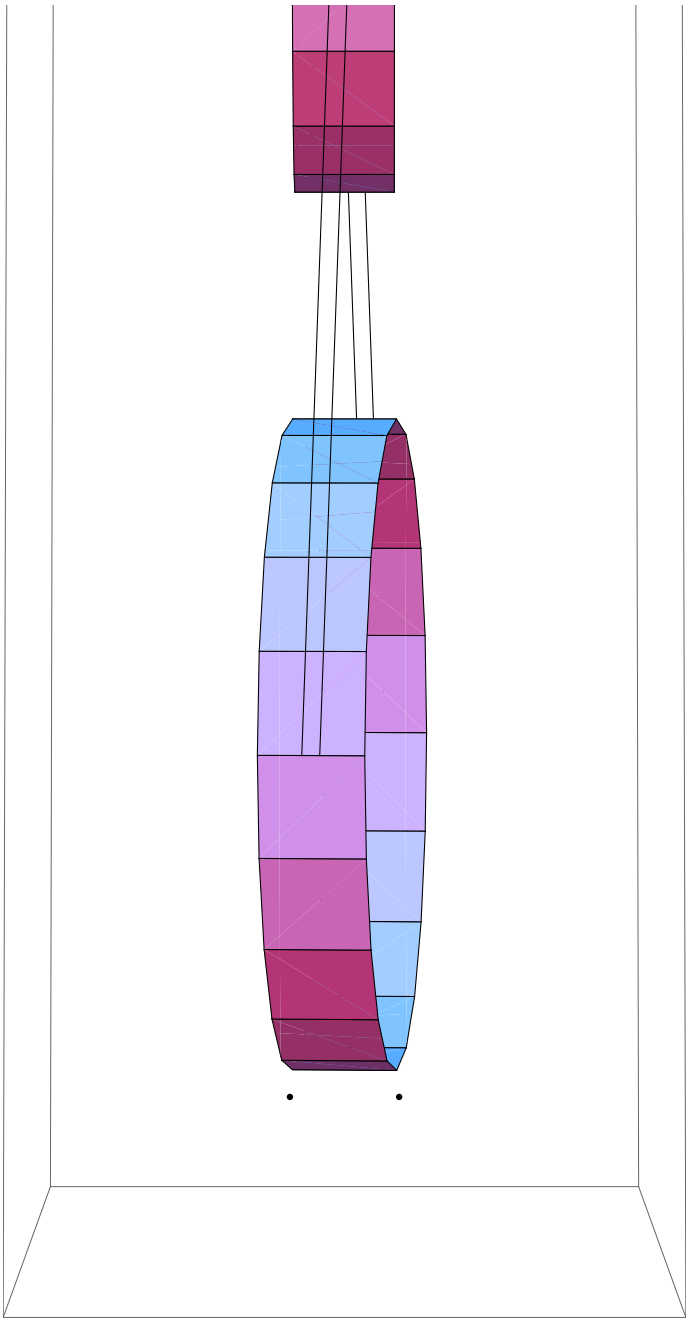
```
pretty[Chop[e2ni.eigenvectors2[[-9]], 10^-4]]
```

```
       x  y  z  yaw        pitch        roll
Mass U 0  0  0  -0.863911  -0.00145428  0
Mass I 0  0  0  0.0192565  0.000427832  0
optic  0  0  0  0.503273   -0.00013974  0
```

```
DoWithStatus["Plotting stage 2 mode 9",
 eigenplot[eigenvectors2[[-9]], -0.2, {0, -3, -0.25}, floatmatrix2]]
```







#10

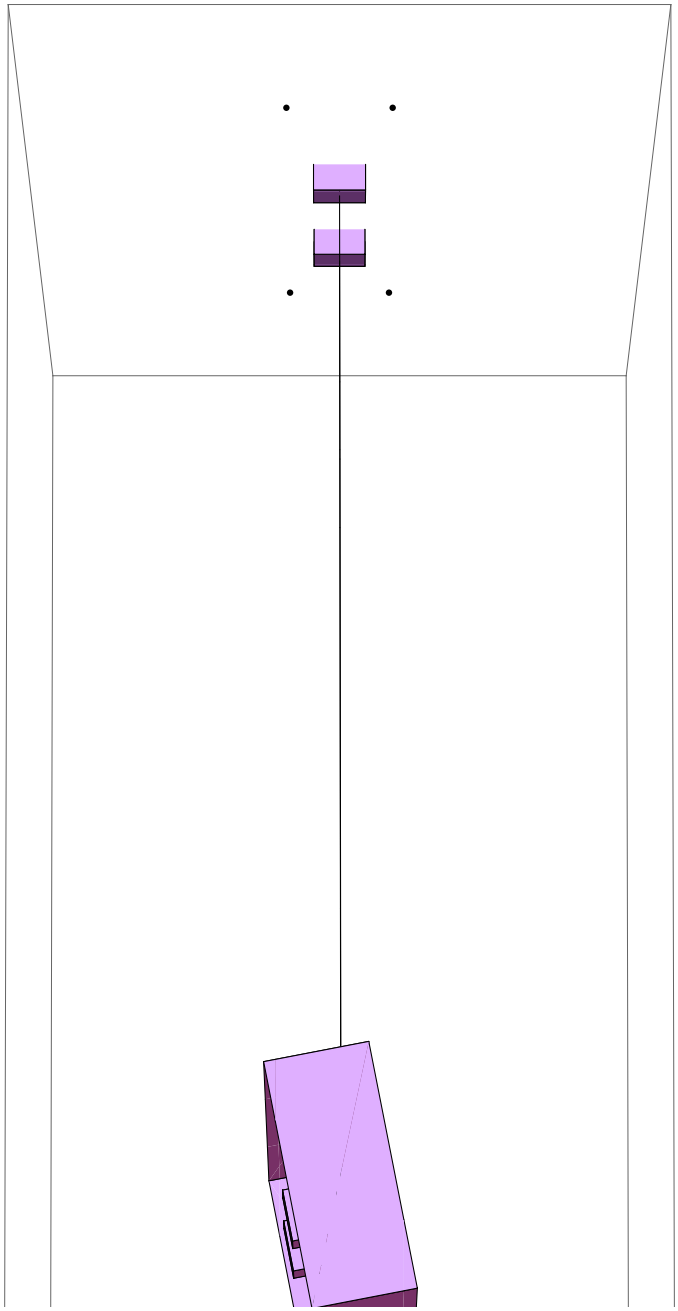
Hz2[[-10]]

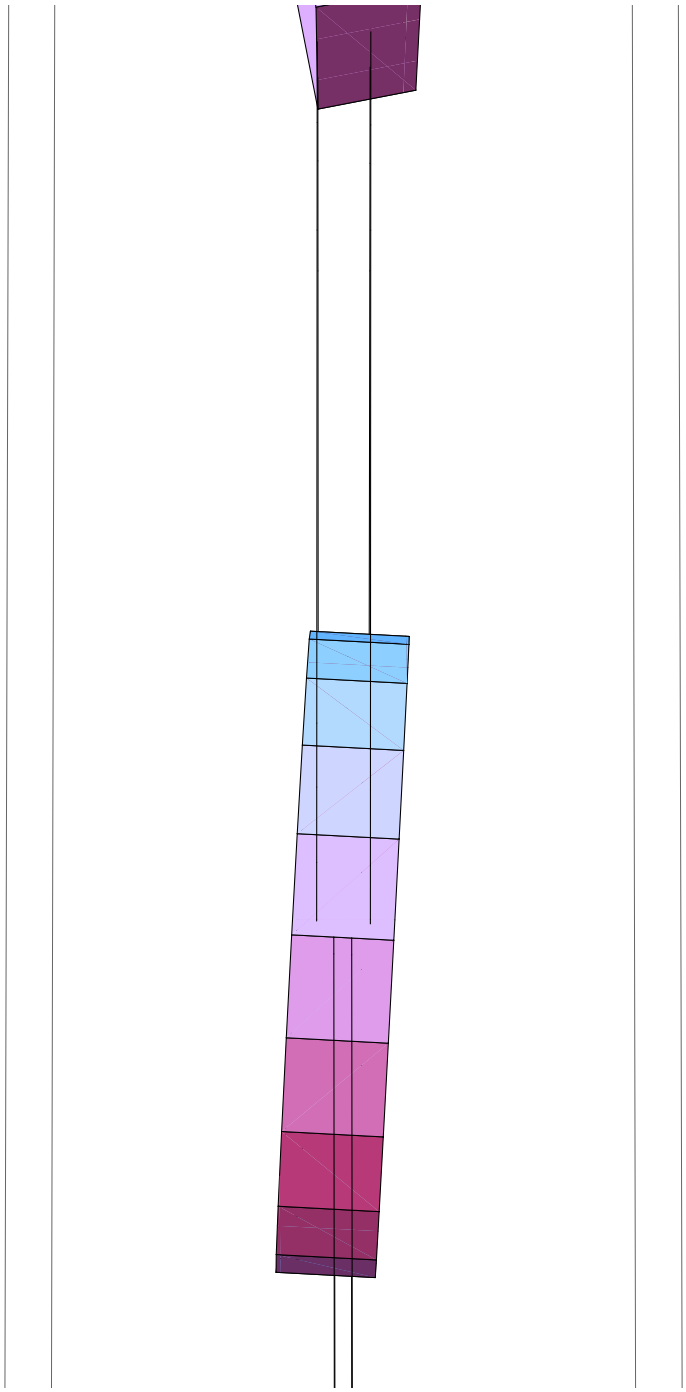
1.38735

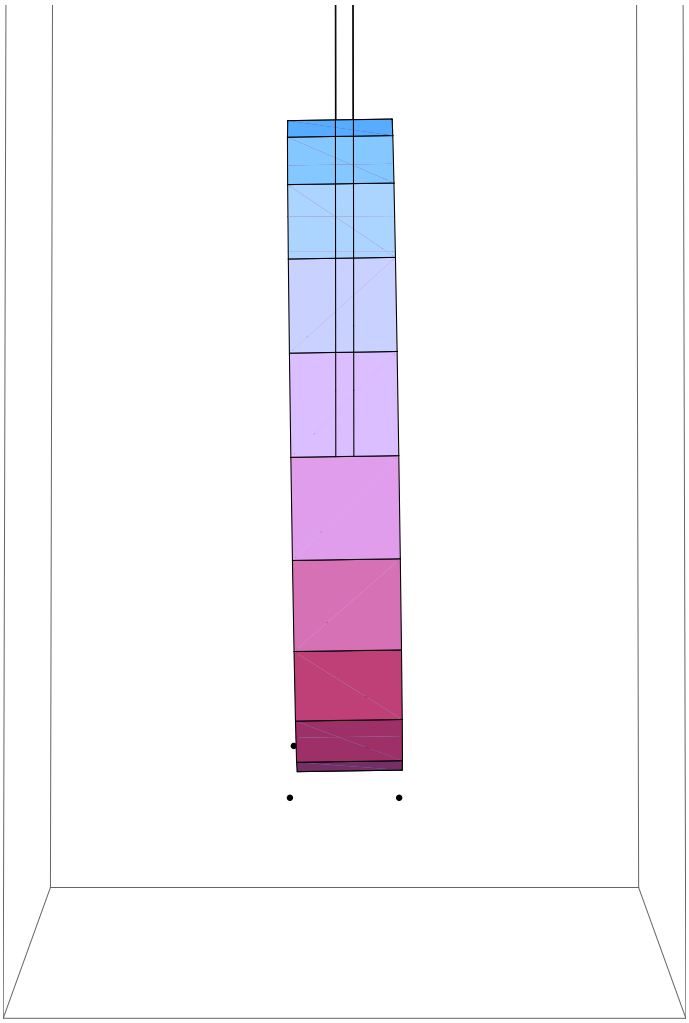
pretty[Chop[e2ni.eigenvectors2[[-10]], 10^-4]]

	x	y	z	yaw	pitch	roll
Mass U	-0.00242857	0	0	-0.0002646	0.961047	0
Mass I	0.00219807	0	0	0	-0.265851	0
optic	-0.000836278	0	0	0.000206856	0.0755048	0

```
DoWithStatus["Plotting stage 2 mode 10",
 eigenplot[eigenvectors2[[-10]], -.2, {0, -3, -.25}, floatmatrix2]]
```







#11

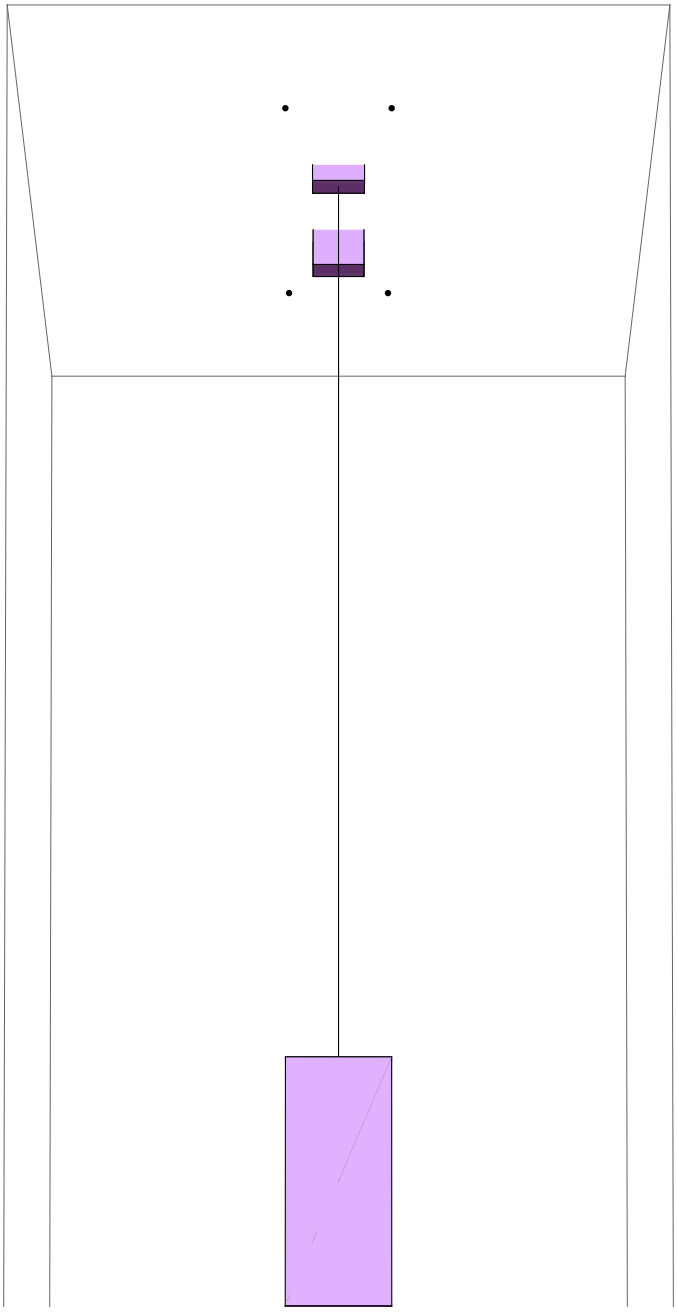
```
Hz2[[-11]]
```

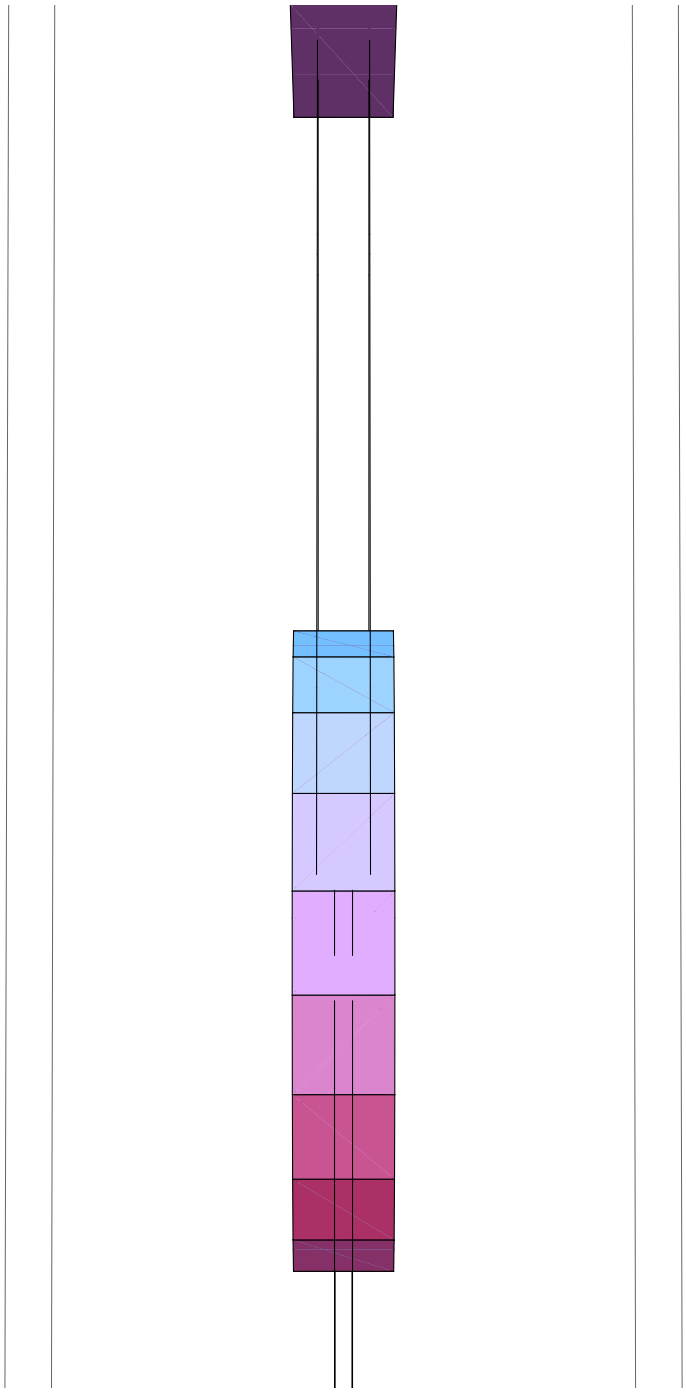
```
1.57059
```

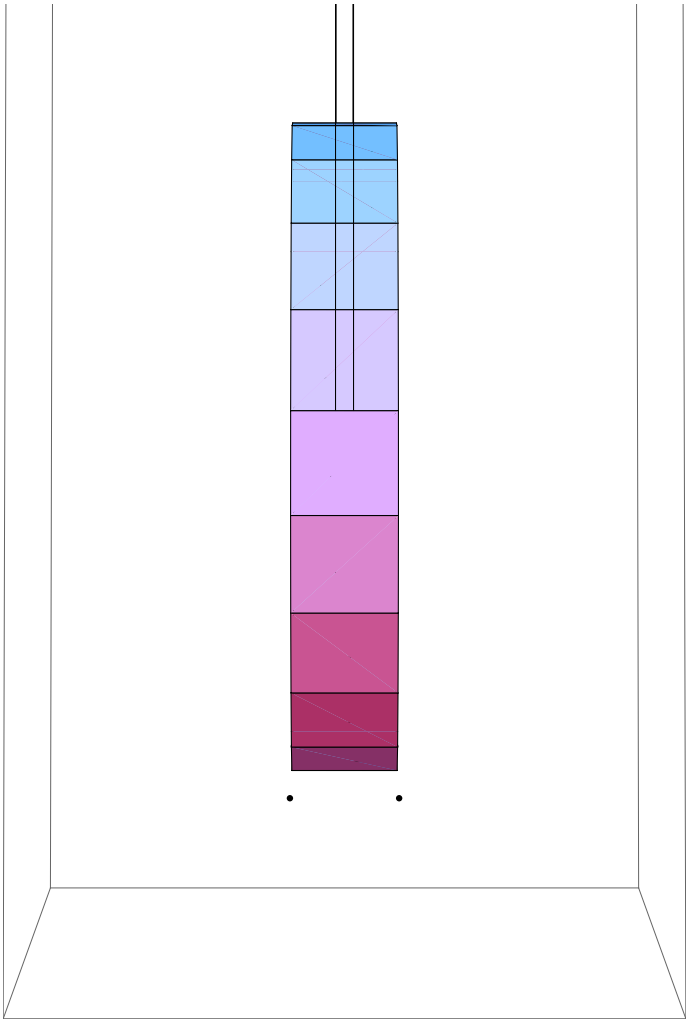
```
pretty[Chop[e2ni.eigenvectors2[[-11]], 10^-4]]
```

```
       x  y          z  yaw  pitch         roll
Mass U 0  -0.223312  0  0    -0.00094808   0.0794781
Mass I 0  0.123467   0  0    0.000792265   0.678246
optic  0  -0.0316663 0  0    -0.000516693  0.683776
```

```
DoWithStatus["Plotting stage 2 mode 11",
 eigenplot[eigenvectors2[[-11]], -.2, {0, -3, -.25}, floatmatrix2]]
```







#12

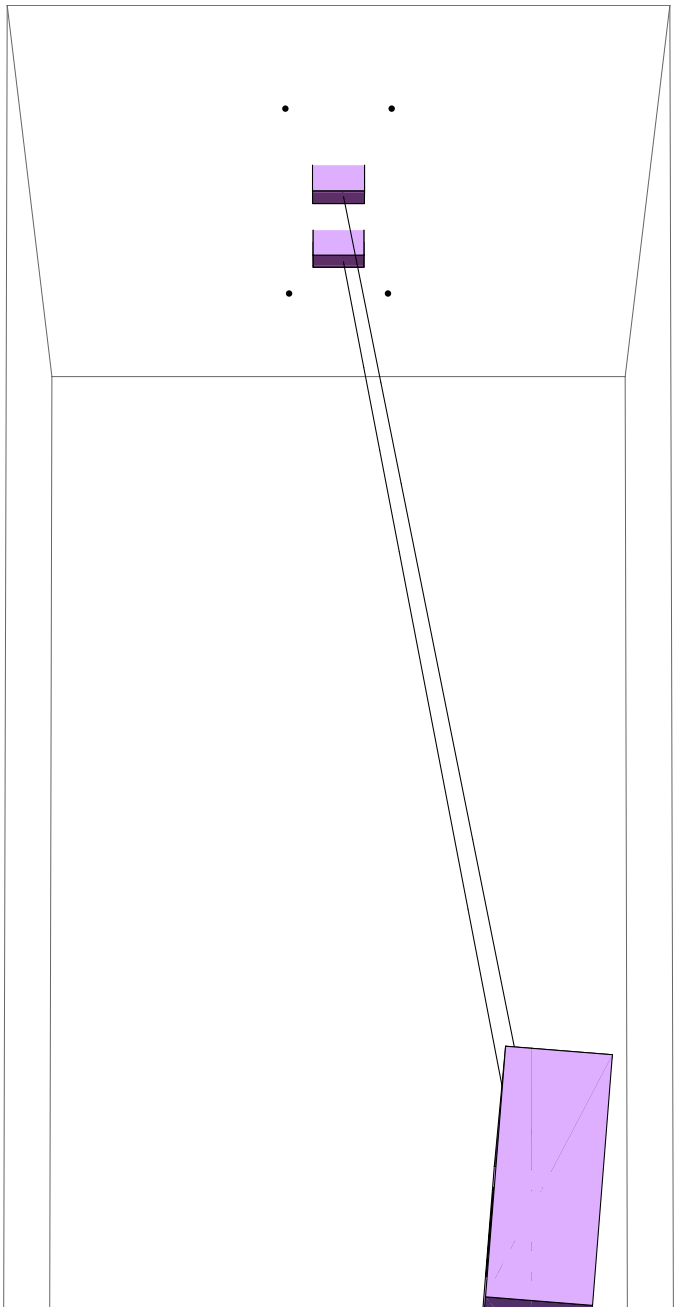
```
Hz2[[-12]]
```

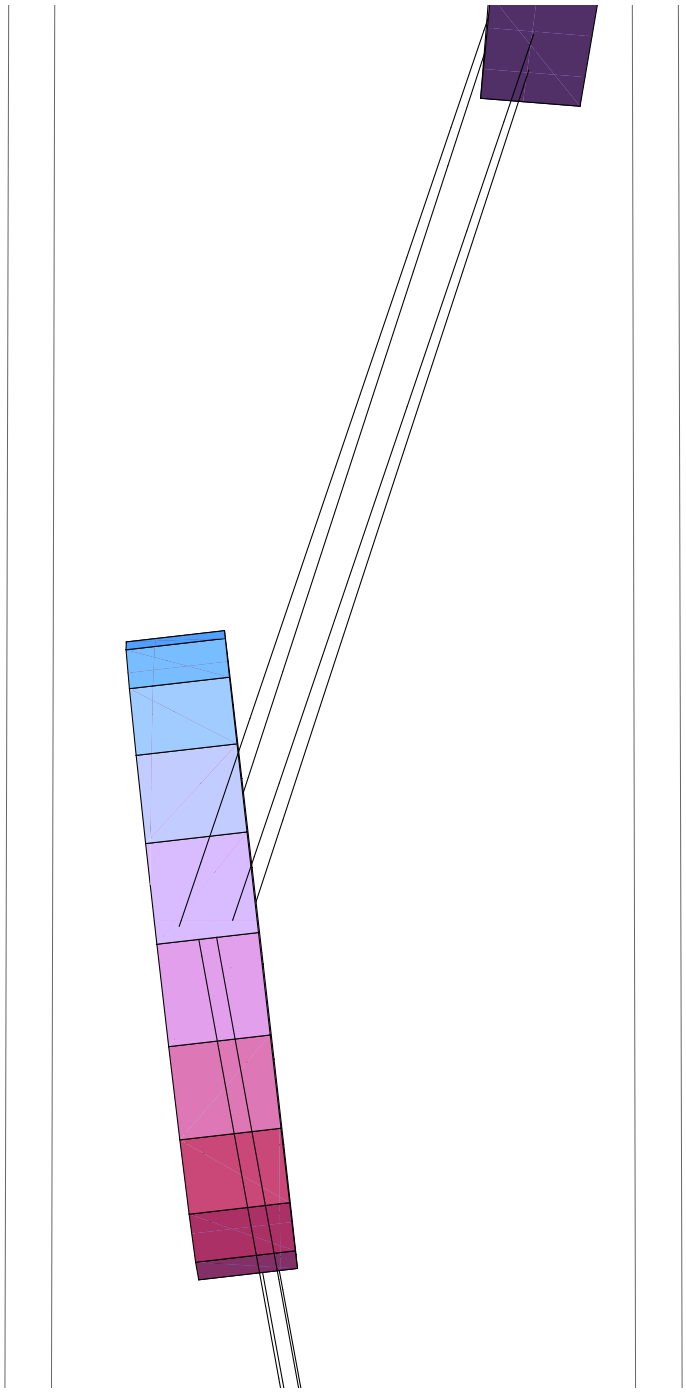
```
1.69263
```

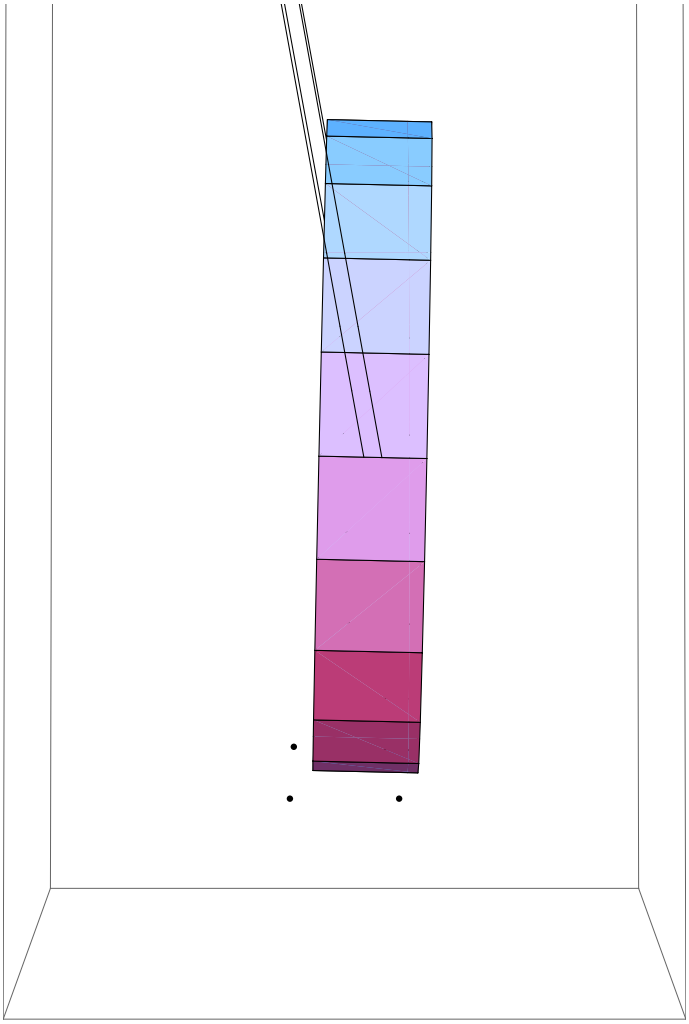
```
pretty[Chop[e2ni.eigenvectors2[[-12]], 10^-4]]
```

```
       x           y  z  yaw          pitch      roll
Mass U -0.589584   0  0  0.00290599   -0.402101  0
Mass I 0.379796    0  0  -0.00348679  0.572561   0
optic  -0.0800312  0  0  0.00762186   -0.110226  0
```

```
DoWithStatus["Plotting stage 2 mode 12",
 eigenplot[eigenvectors2[[-12]], -.2, {0, -3, -.25}, floatmatrix2]]
```







#13

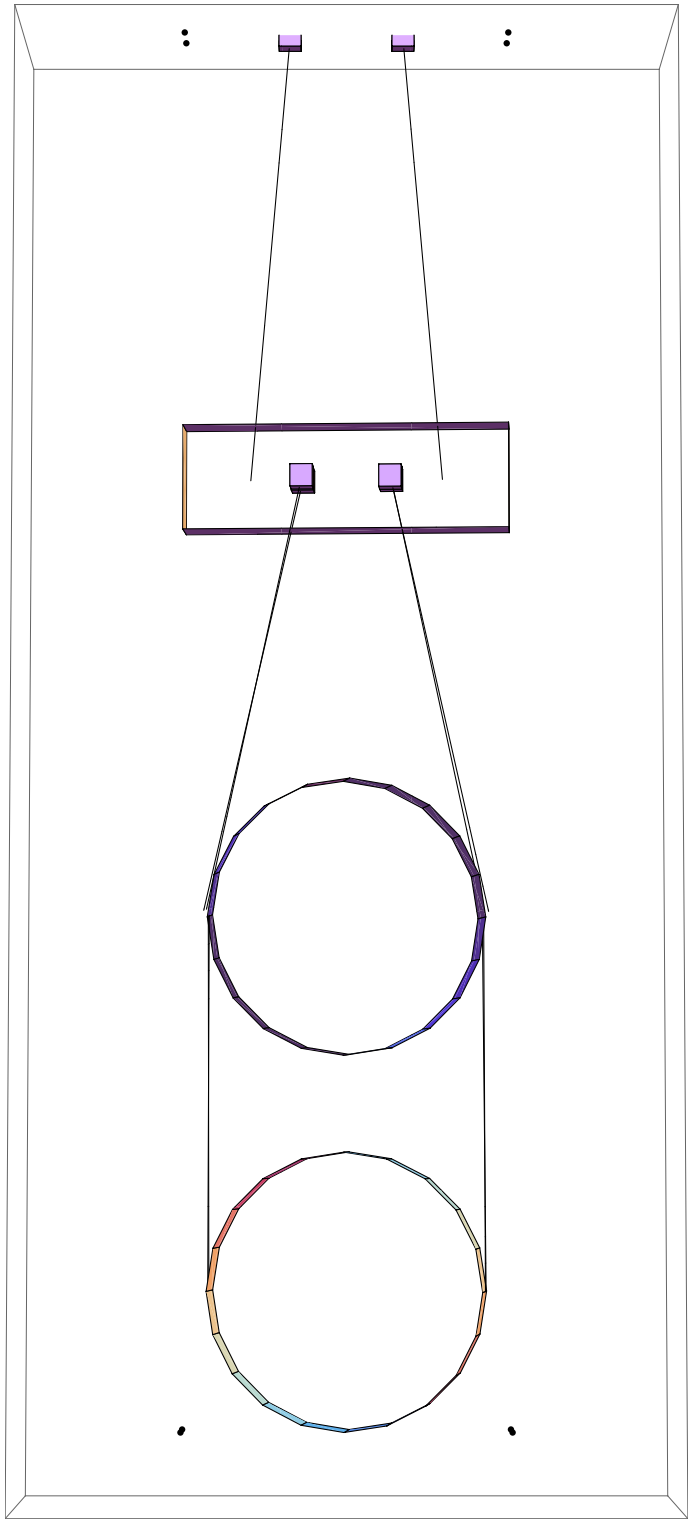
Hz2[[-13]]

2.13289

pretty[Chop[e2ni.eigenvectors2[[-13]], 10^-4]]

	x	y	z	yaw	pitch	roll
Mass U	0	0	0	0.246267	0	0
Mass I	-0.000181731	0	0	-0.772235	0	0
optic	0	0	0	0.585667	0	0

```
DoWithStatus["Plotting stage 2 mode 13",
 eigenplot[eigenvectors2[[-13]], -.2, {-3, 0, -.25}, floatmatrix2]]
```



#14

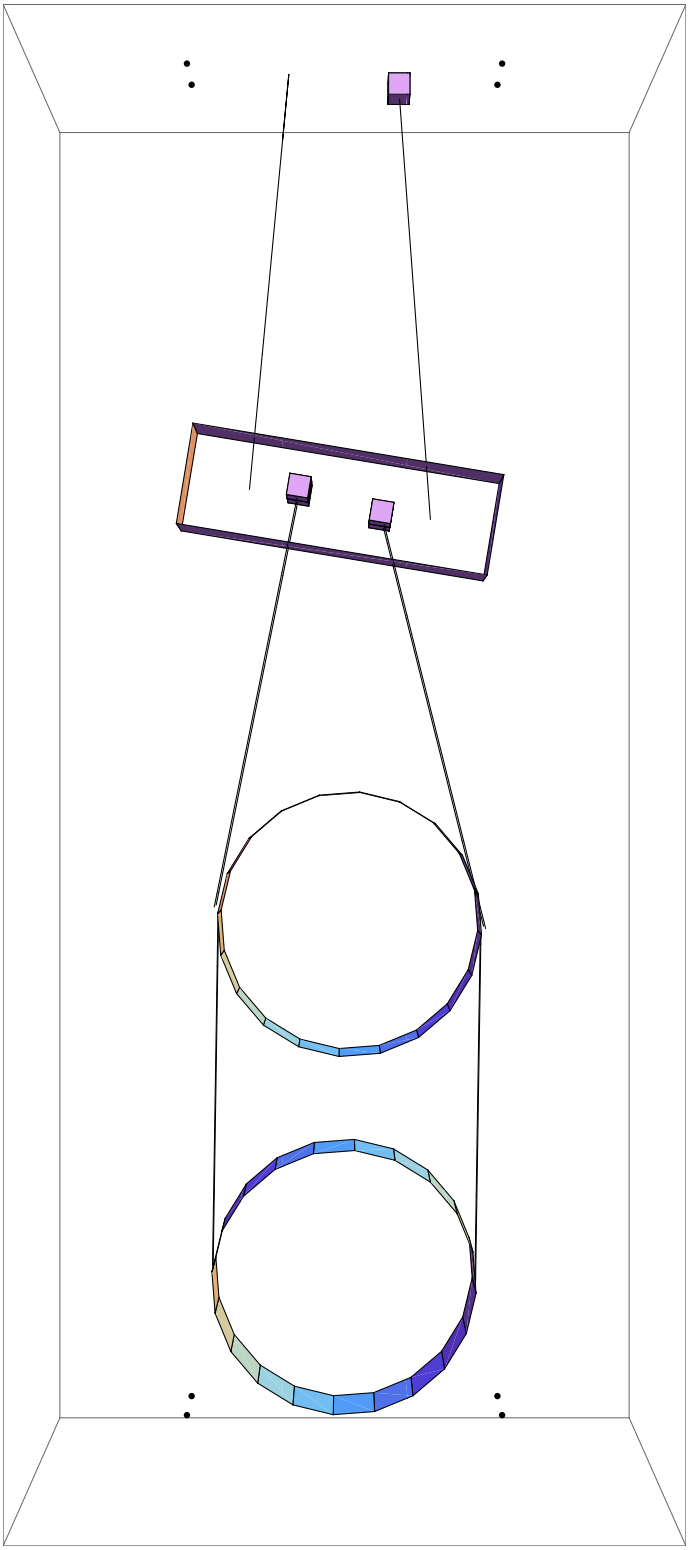
```
Hz2[[-14]]
```

```
2.26467
```

```
pretty[Chop[e2ni.eigenvectors2[[-14]], 10^-4]]
```

```
       x  y           z  yaw  pitch         roll
Mass U 0  -0.0311543  0  0    0             -0.821517
Mass I 0  0.0349534   0  0    -0.000234508  -0.398368
optic  0  -0.00368186 0  0    0.000208268   -0.405225
```

```
DoWithStatus["Plotting stage 2 mode 14",
 eigenplot[eigenvectors2[[-14]], -.2, {-1, 0, 0}, floatmatrix2] ]
```



#15

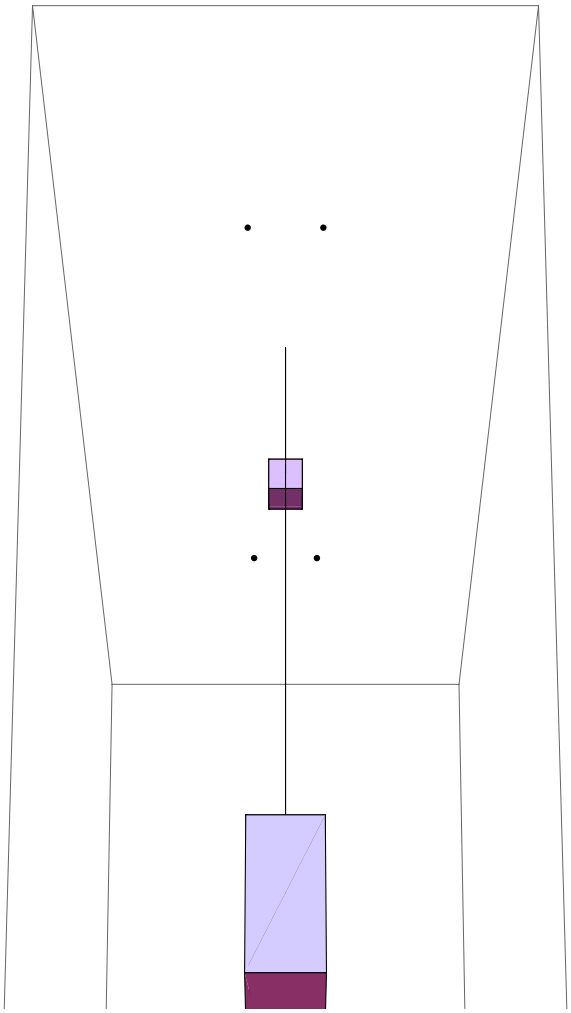
```
Hz2[[-15]]
```

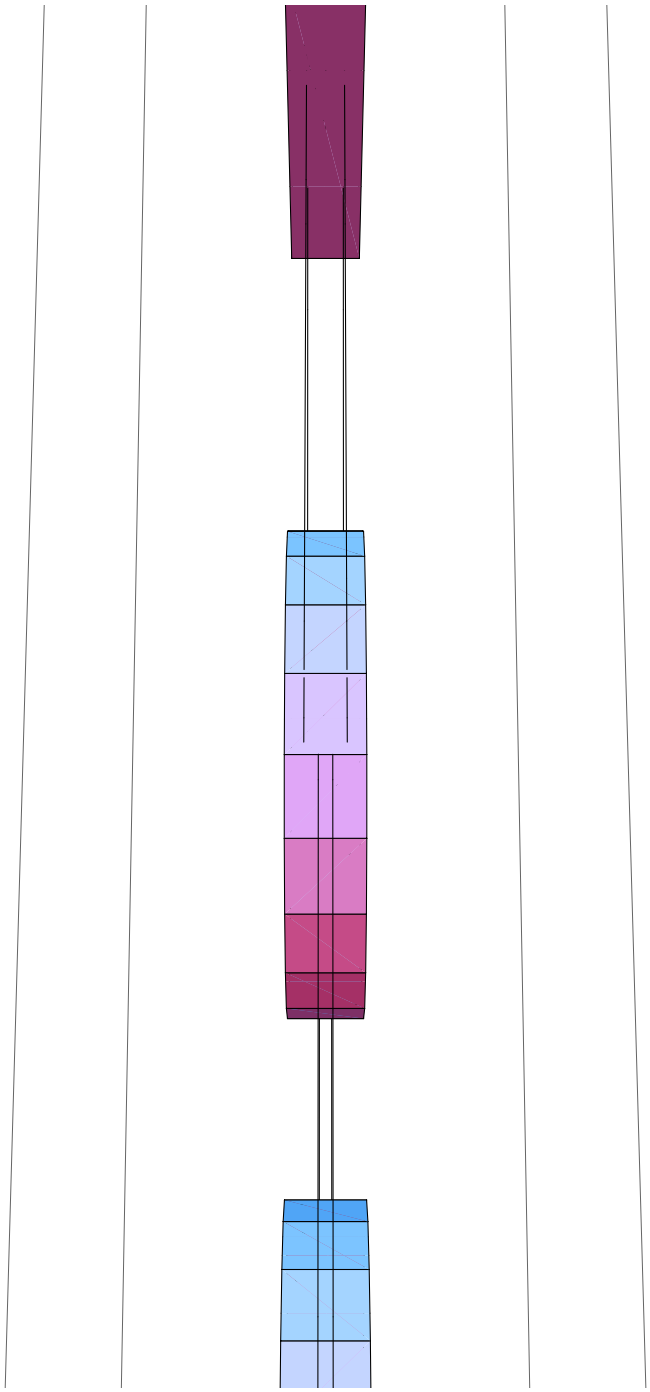
```
3.50013
```

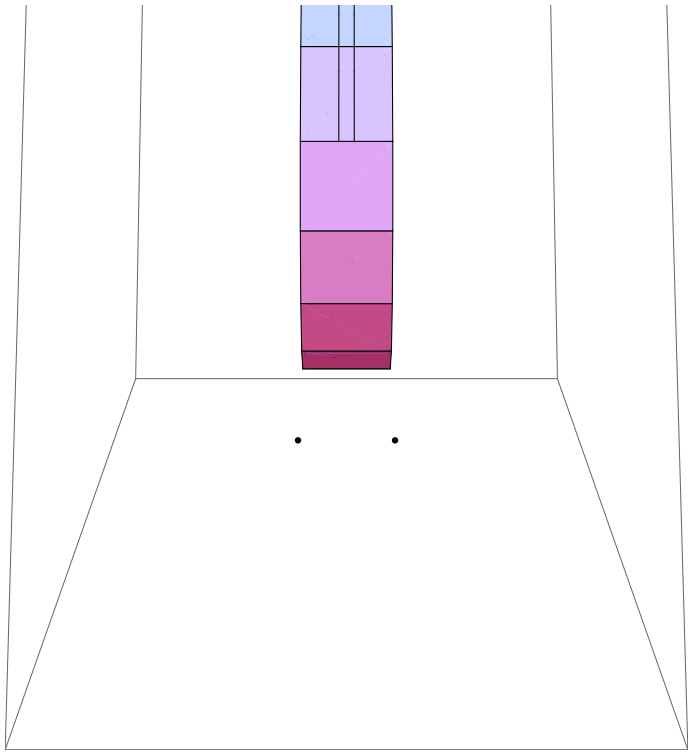
```
pretty[Chop[e2ni.eigenvectors2[[-15]], 10^-4]]
```

```
       x  y             z  yaw  pitch          roll
Mass U 0  -0.0328151    0  0    0              0.80179
Mass I 0  0.0240952     0  0    -0.000193305   -0.412794
optic  0  -0.000987602  0  0    0.000195153    -0.430204
```

```
DoWithStatus["Plotting stage 2 mode 15",
 eigenplot[eigenvectors2[[-15]], -.2, {0, -1, -.25}, floatmatrix2]]
```







#16

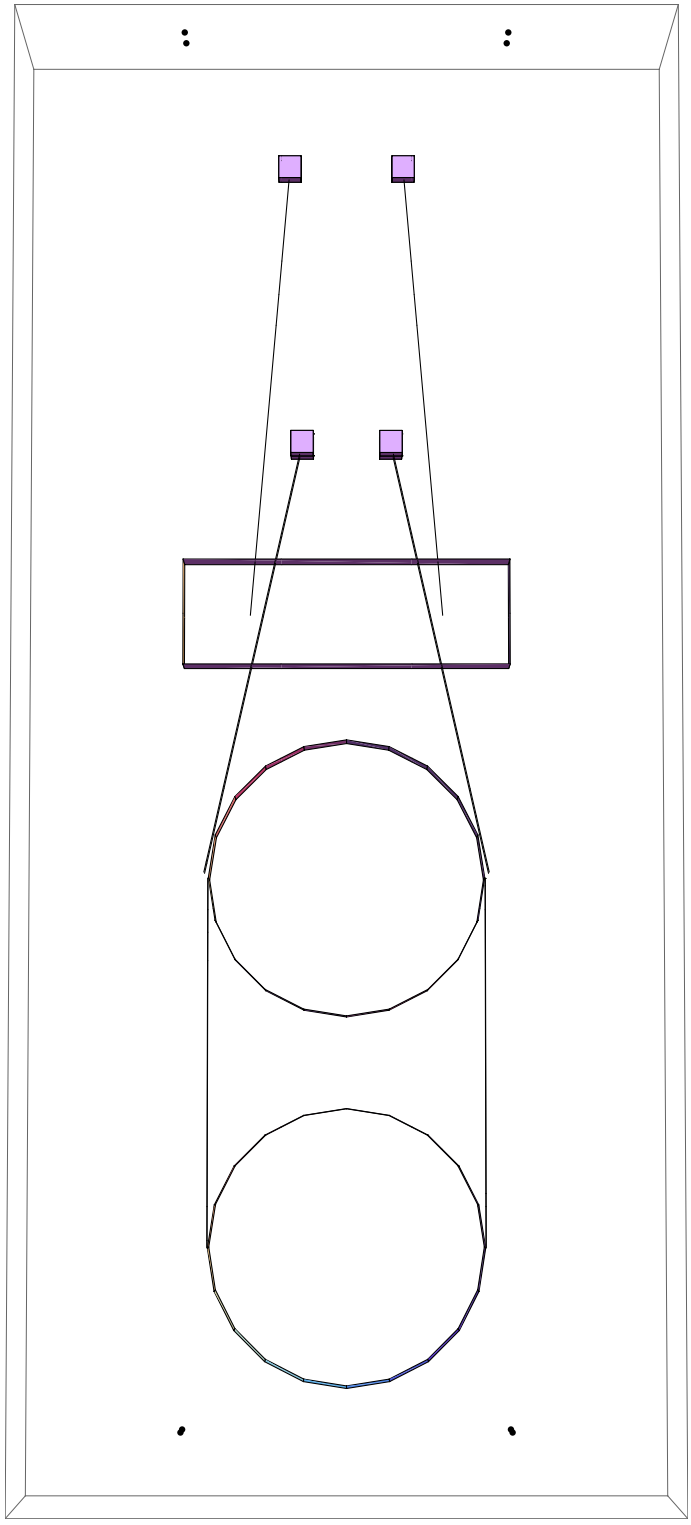
Hz2[[-16]]

```
4.07335
```

pretty[Chop[e2ni.eigenvectors2[[-16]], 10^-4]]

```
        x  y  z          yaw  pitch  roll
Mass U  0  0  0.922117   0    0      0.000445666
Mass I  0  0  -0.256983  0    0      -0.000492791
optic   0  0  -0.28924   0    0      -0.00039894
```

```
DoWithStatus["Plotting stage 2 mode 16",
 eigenplot[eigenvectors2[[-16]], -0.2, {-3, 0, -0.25}, floatmatrix2]]
```



#17

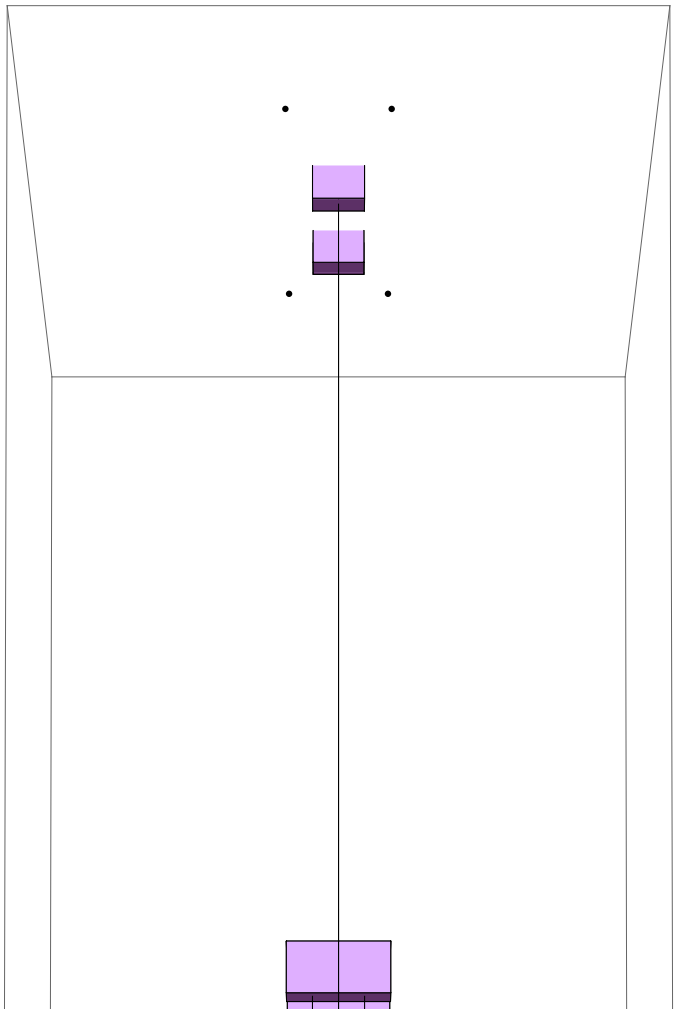
```
Hz2[[-17]]
```

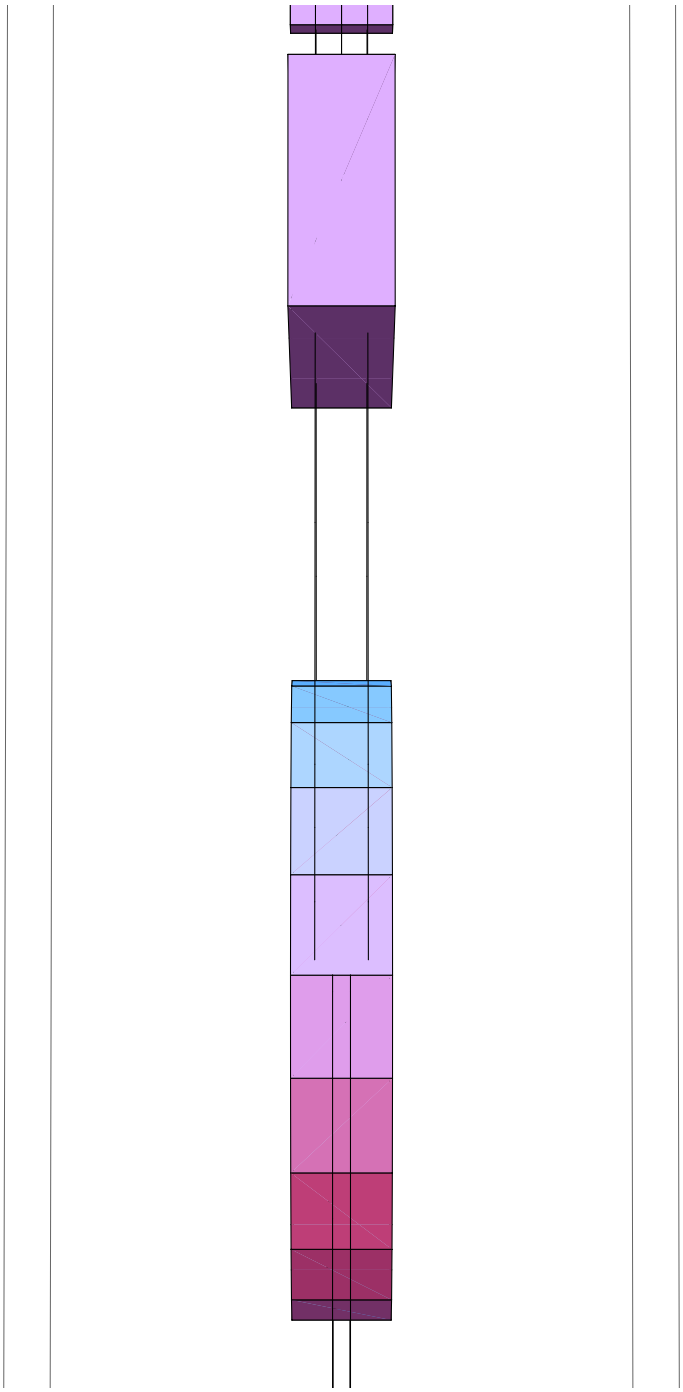
```
17.5566
```

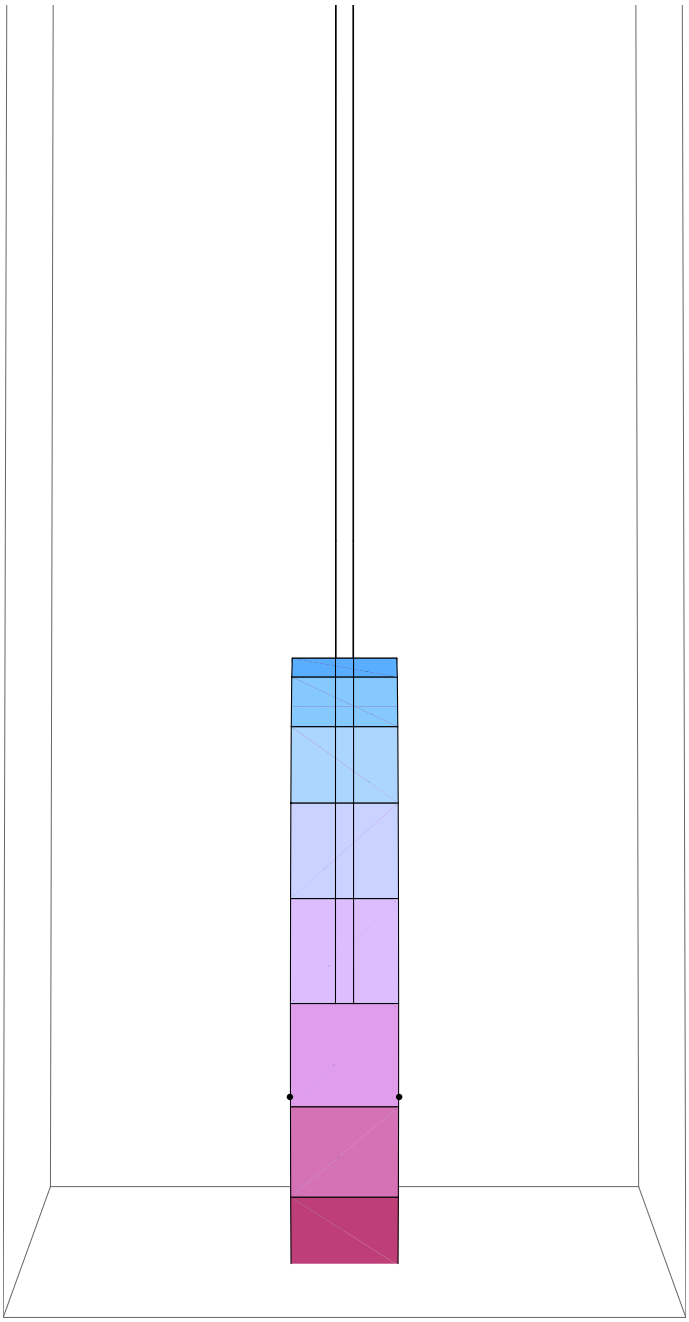
```
pretty[Chop[e2ni.eigenvectors2[[-17]], 10^-4]]
```

```
       x  y  z          yaw  pitch  roll
Mass U 0  0  0.0210306  0    0      0
Mass I 0  0  -0.730985  0    0      0.00497272
optic  0  0  0.682033   0    0      0.00501716
```

```
DoWithStatus["Plotting stage 2 mode 17",
 eigenplot[eigenvectors2[[-17]], -.2, {0, -3, -.25}, floatmatrix2]]
```







#18

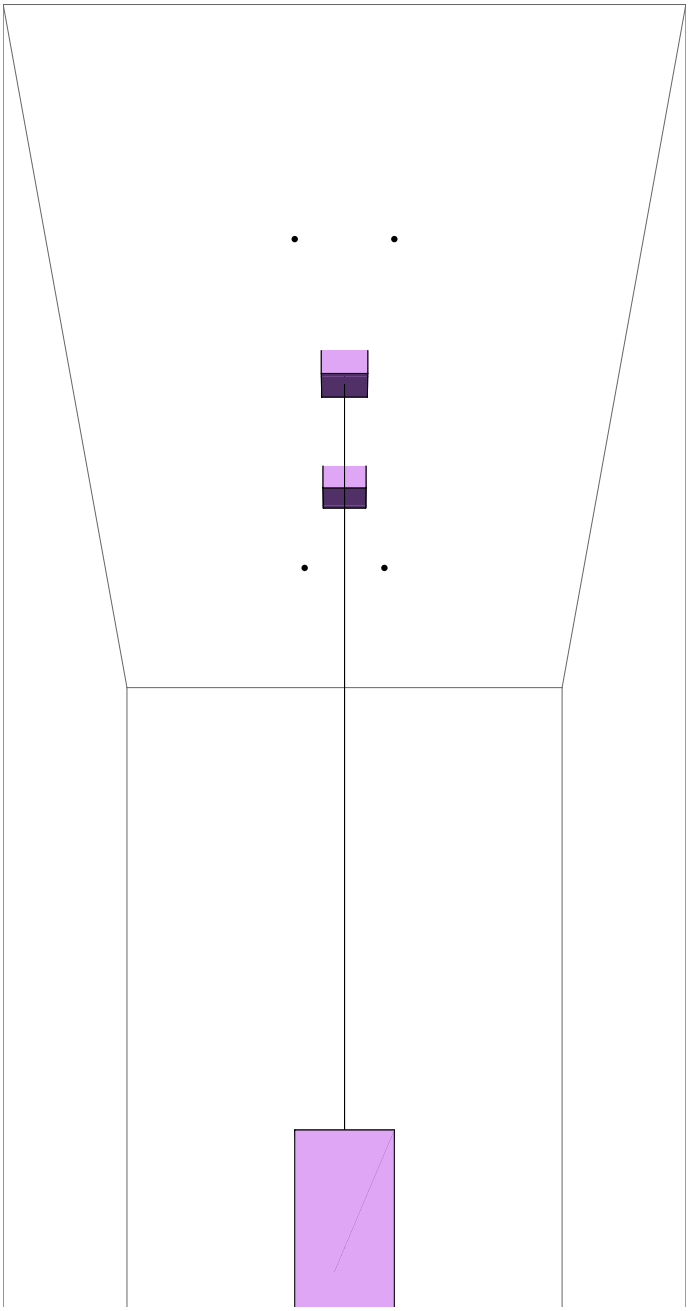
Hz2[[-18]]

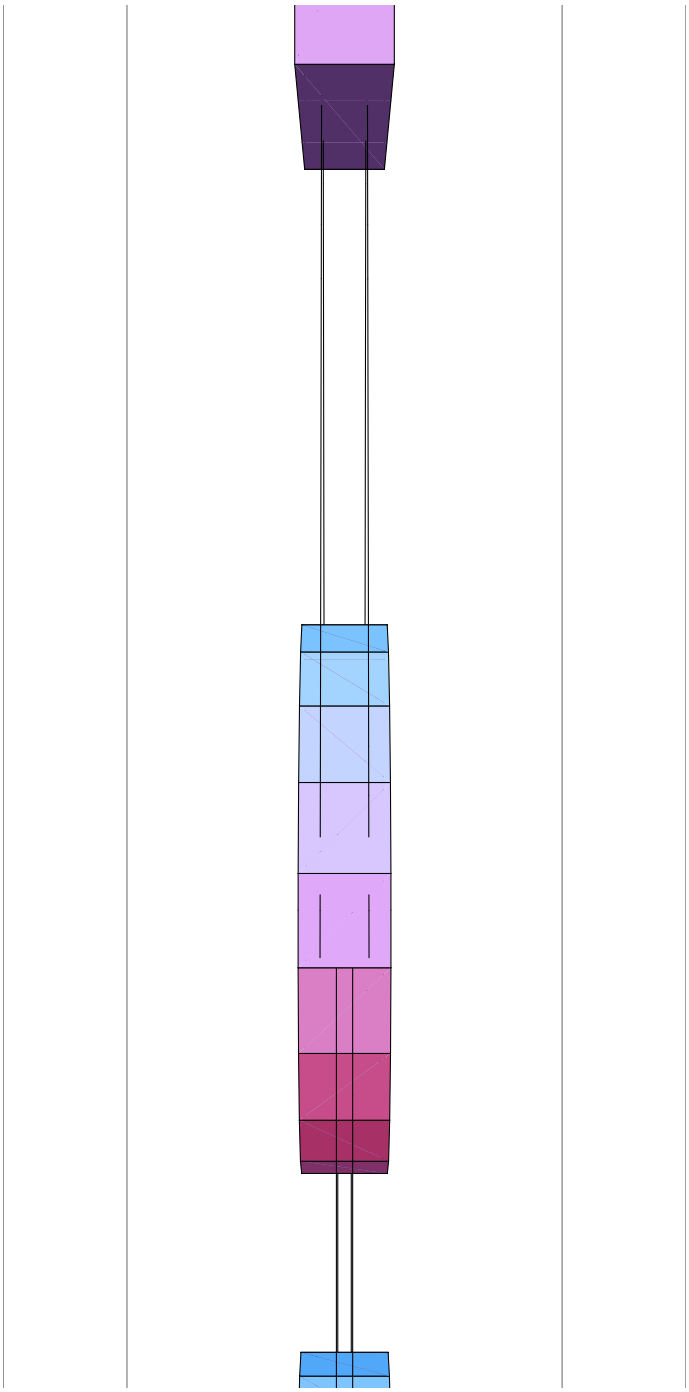
24.3393

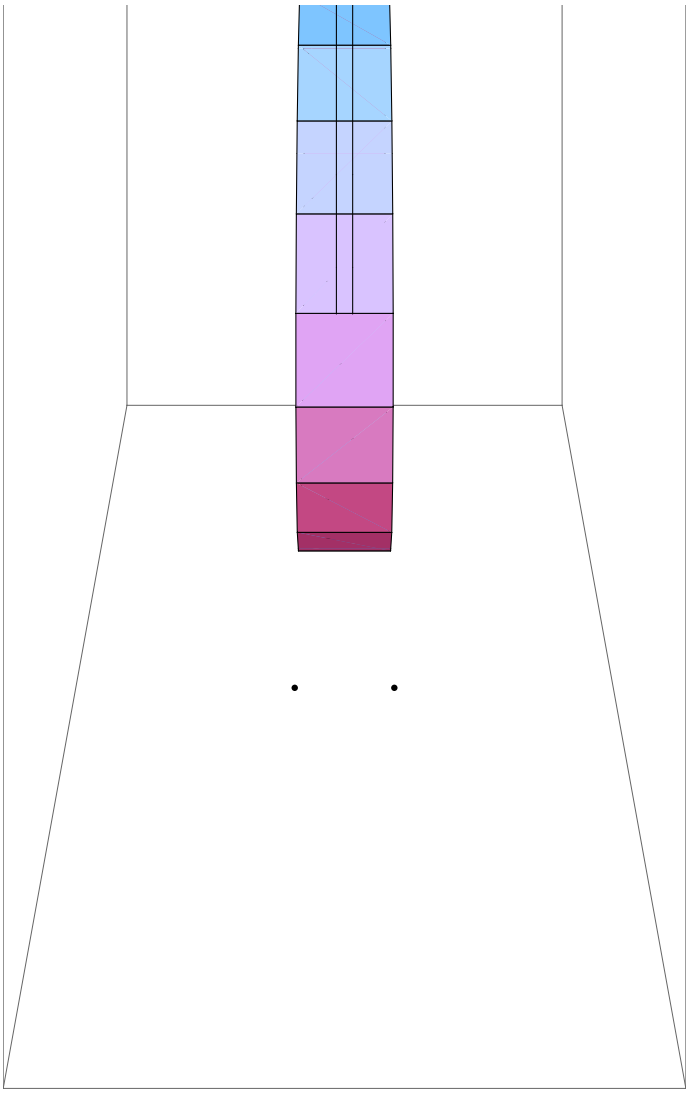
pretty[Chop[e2ni.eigenvectors2[[-18]], 10^-4]]

	x	y	z	yaw	pitch	roll
Mass U	0	-0.000443094	0	0	0	0.00681086
Mass I	0	0.000410681	0	0	-0.000282463	-0.692119
optic	0	0	0	0	-0.000304341	0.721751

```
DoWithStatus["Plotting stage 2 mode 18",
 eigenplot[eigenvectors2[[-18]], -.2, {0, -1, 0}, floatmatrix2]]
```





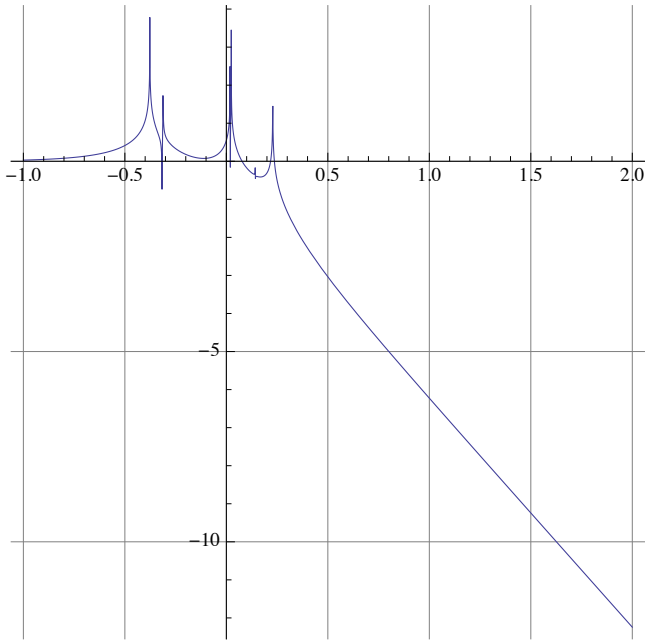


- **Structure displacement to optic displacement transfer function plots**

- **x**

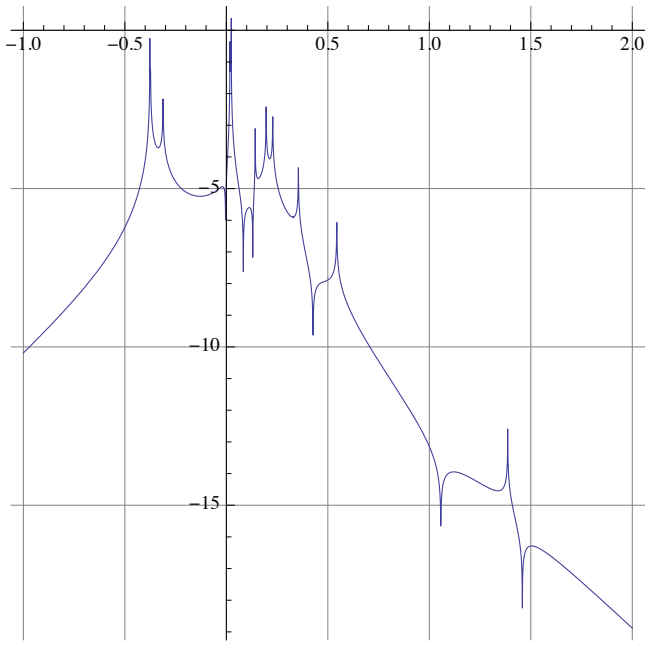
x to x

```
plotTF[eom2,coupling2,supportxinput,opticxoutput,0.1,100]
```



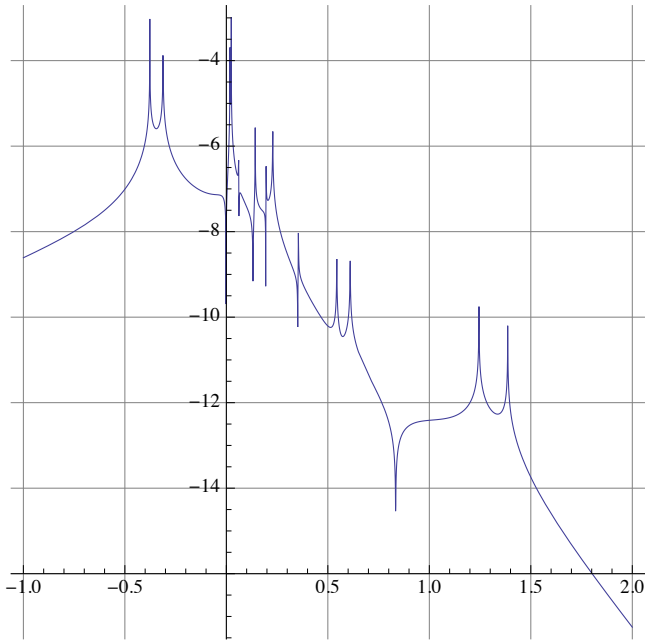
x to y

```
plotTF[eom2,coupling2,supportxinput,opticyoutput,0.1,100]
```



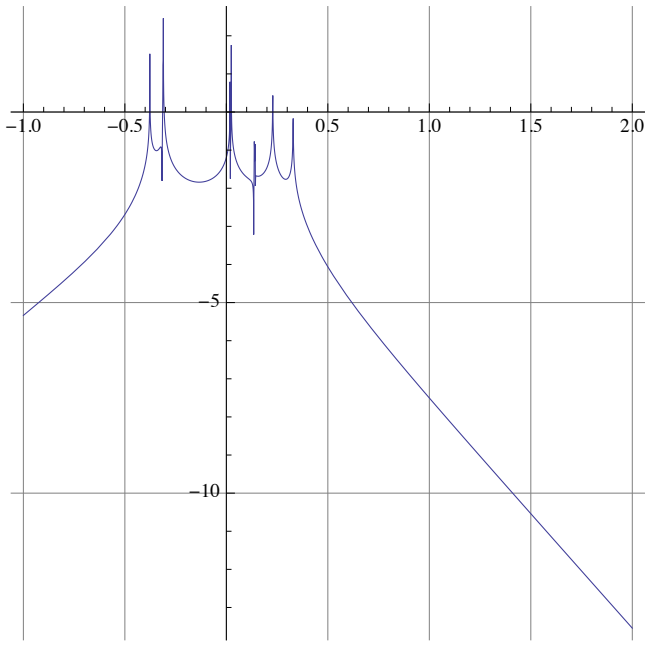
x to z

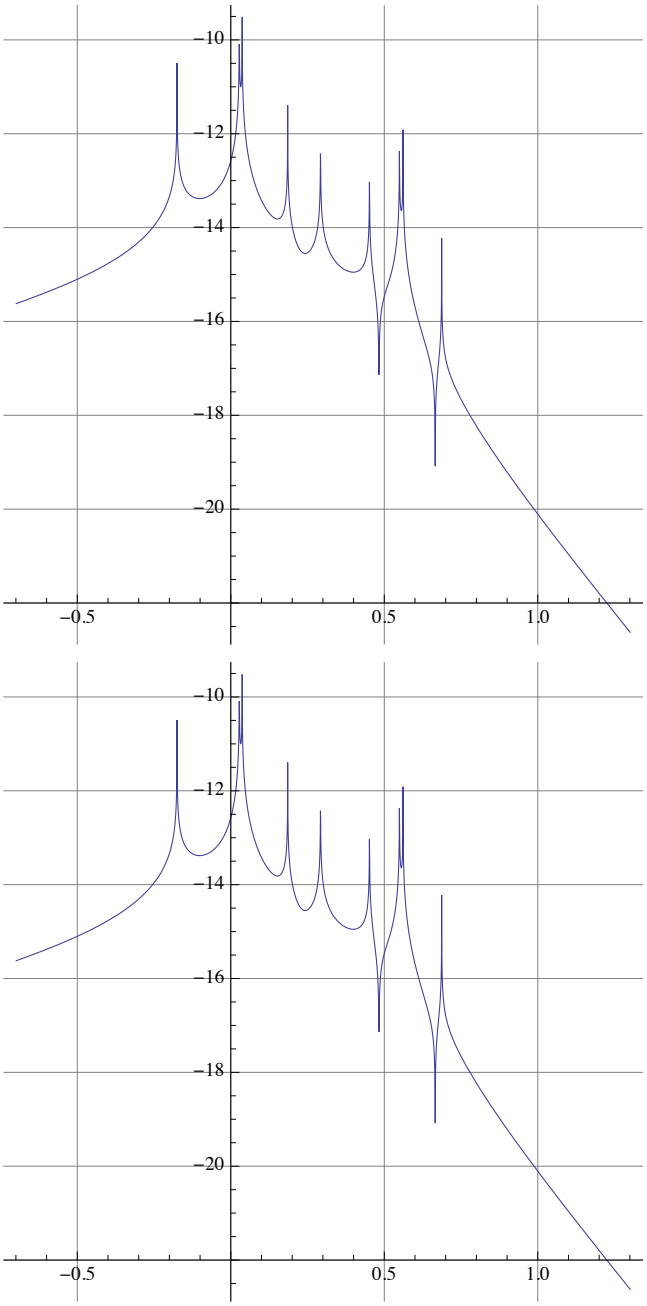
```
plotTF[eom2,coupling2,supportxinput,opticzoutput,0.1,100]
```



x to yaw

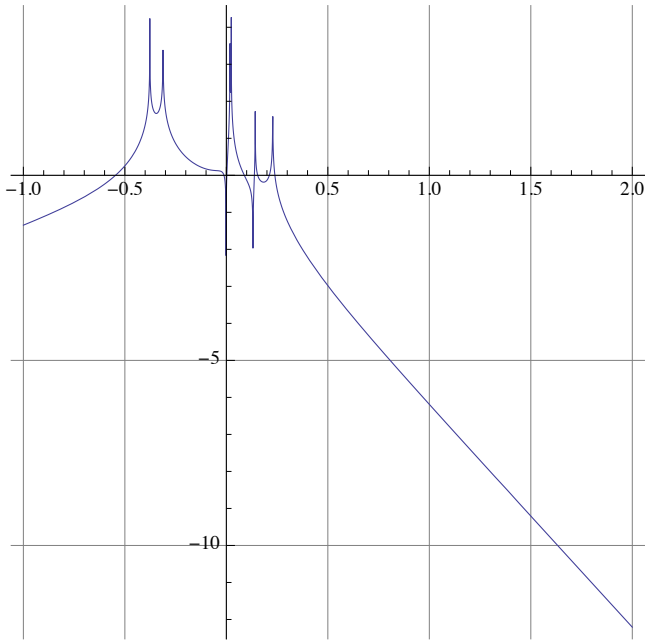
```
plotTF[eom2,coupling2,supportxinput,opticyawoutput,0.1,100]
```





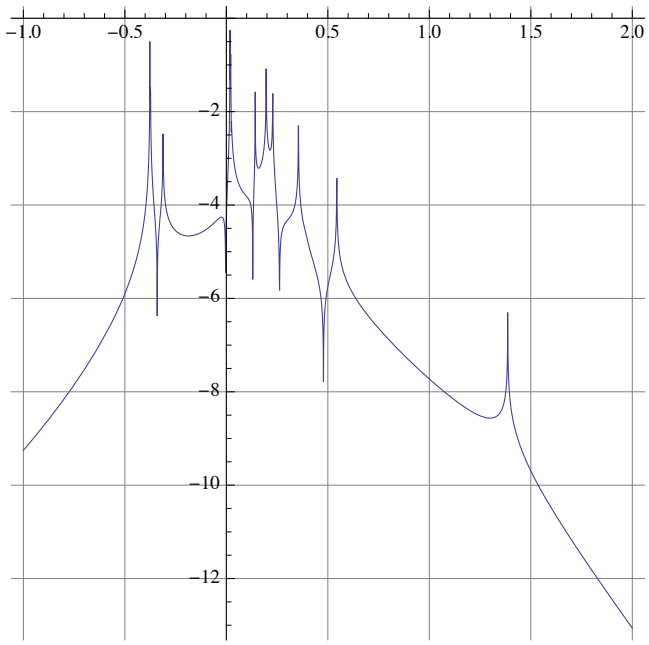
x to pitch

```
plotTF[eom2,coupling2,supportxinput,opticpitchoutput,0.1,100]
```



x to roll

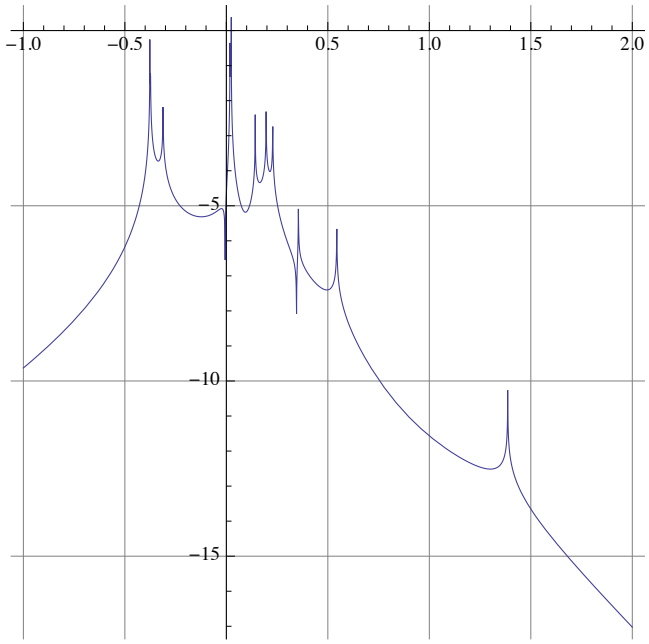
```
plotTF[eom2,coupling2,supportxinput,opticrolloutput,0.1,100]
```



■ y

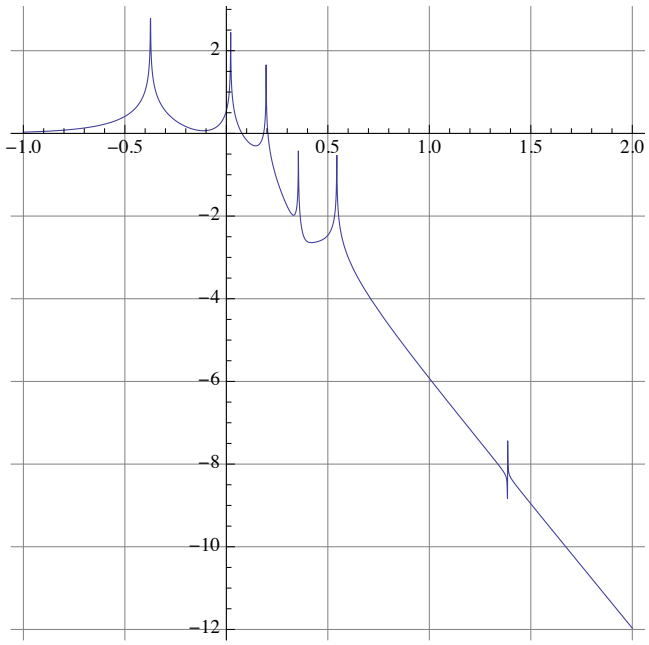
y to x

```
plotTF[eom2,coupling2,supportyinput,opticxoutput,0.1,100]
```



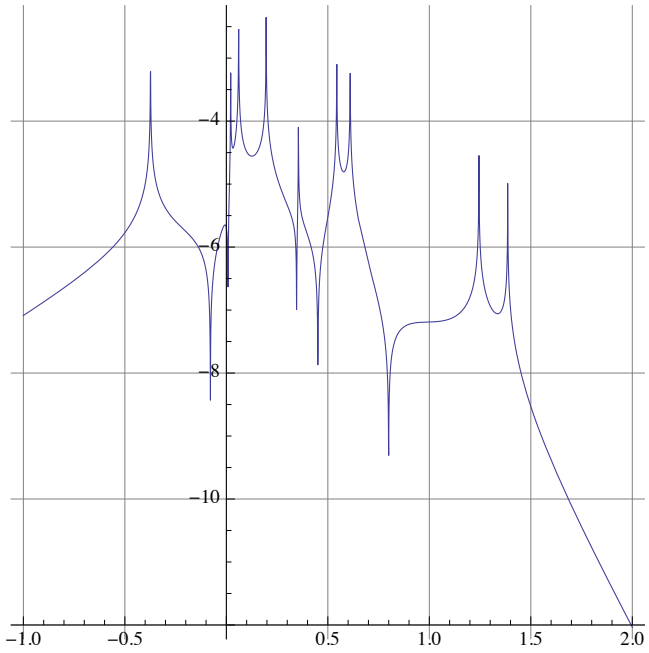
y to y

```
plotTF[eom2,coupling2,supportyinput,opticyoutput,0.1,100]
```



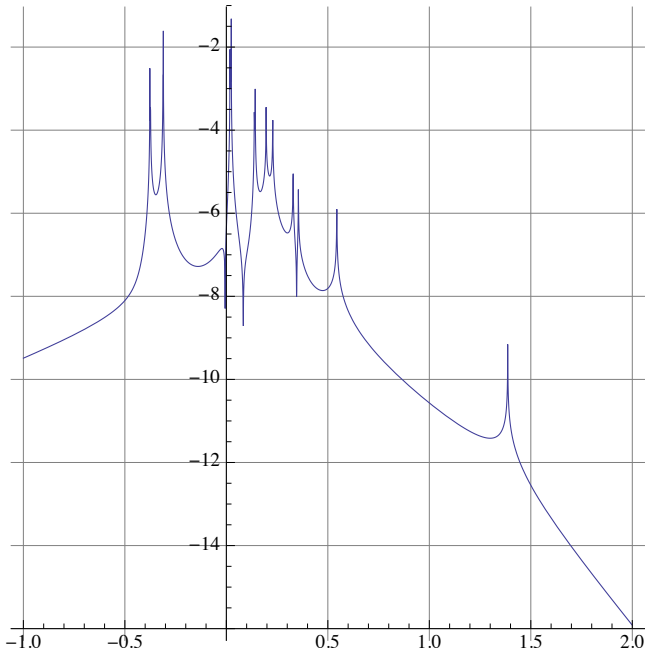
y to z

```
plotTF[eom2,coupling2,supportyinput,opticzoutput,0.1,100]
```



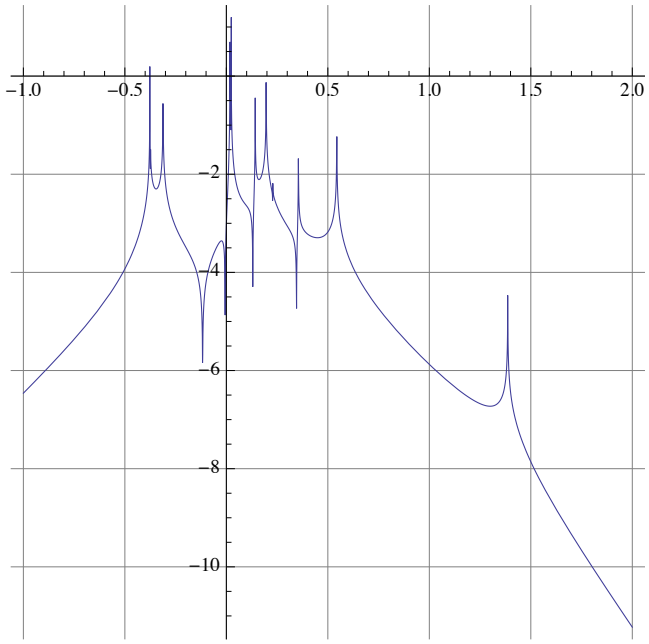
y to yaw

```
plotTF[eom2,coupling2,supportyinput,opticyawoutput,0.1,100]
```



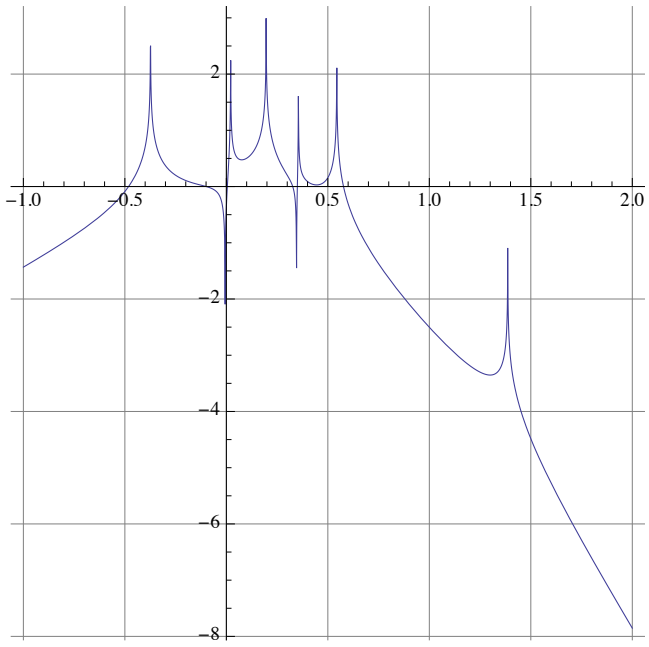
y to pitch

```
plotTF[eom2,coupling2,supportyinput,opticpitchoutput,0.1,100]
```



y to roll

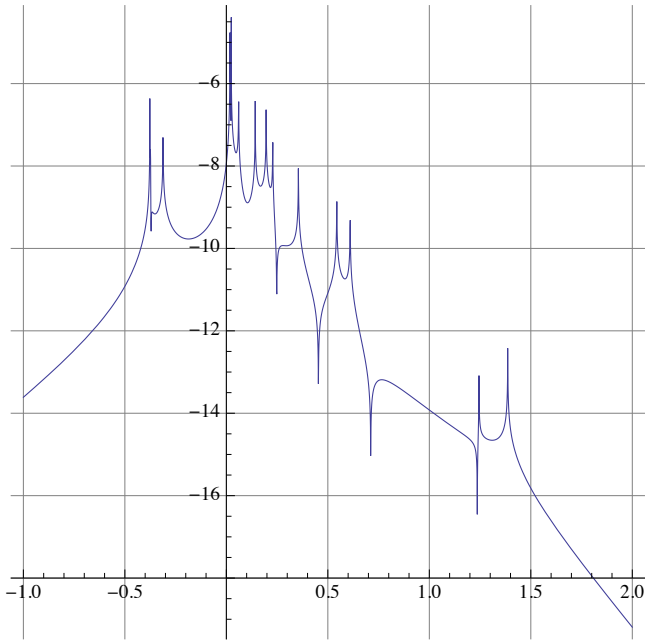
```
plotTF[eom2,coupling2,supportyinput,opticrolloutput,0.1,100]
```



- **z**

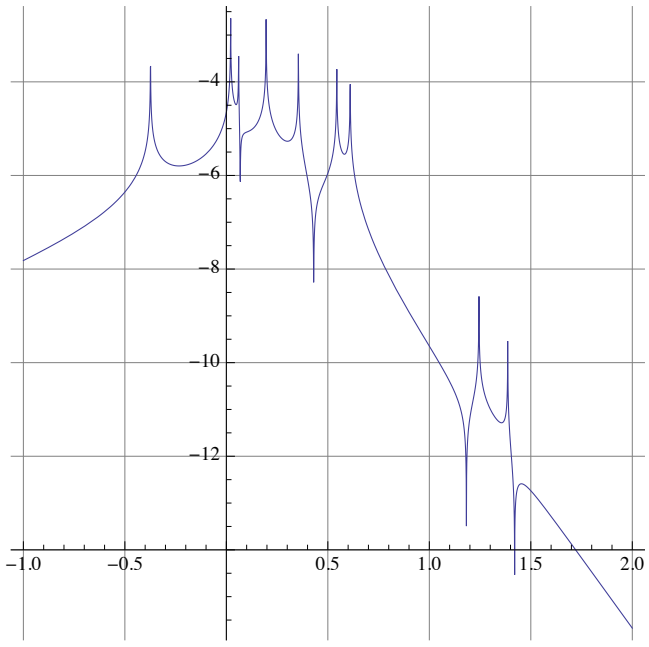
z to x

```
plotTF[eom2,coupling2,supportzinput,opticxoutput,0.1,100]
```



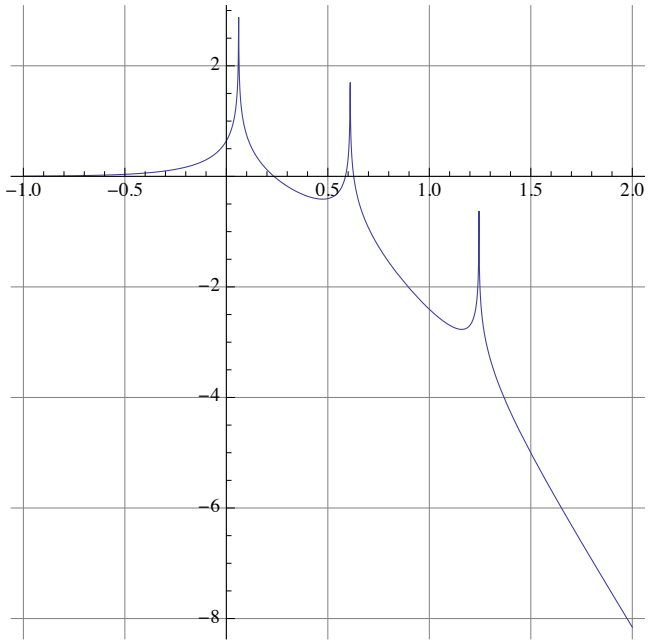
z to y

```
plotTF[eom2,coupling2,supportzinput,opticyoutput,0.1,100]
```



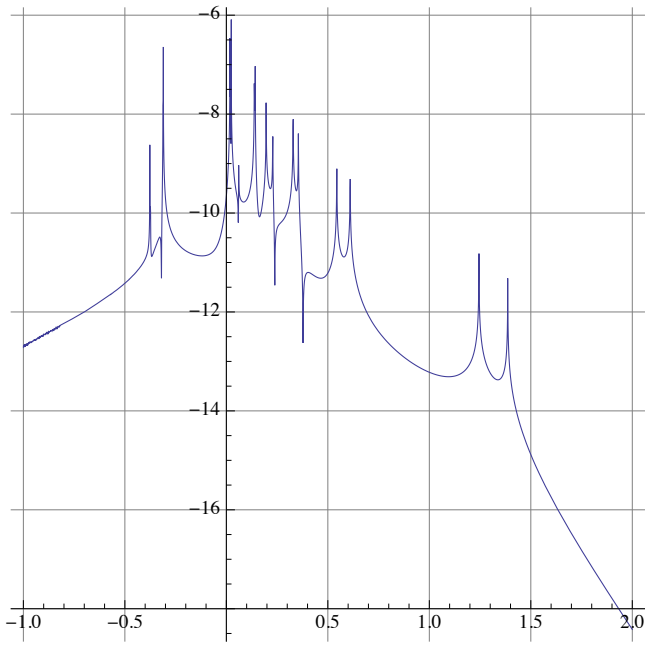
z to z

```
plotTF[eom2,coupling2,supportzinput,opticzoutput,0.1,100]
```



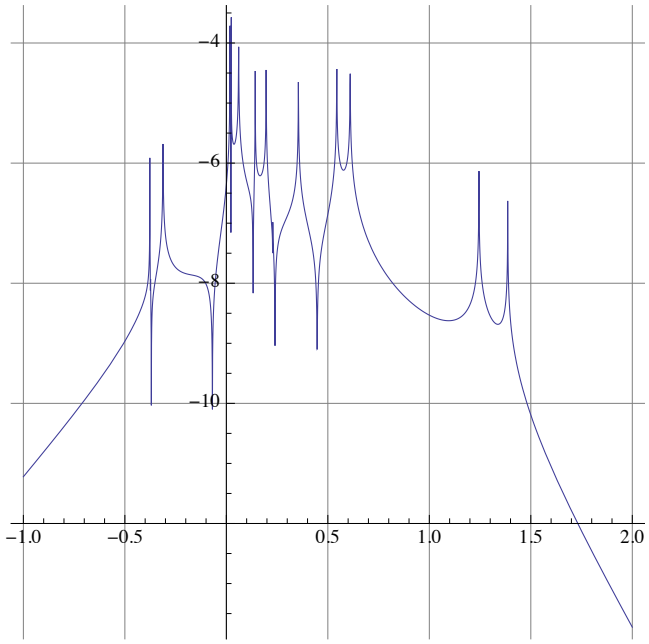
z to yaw

```
plotTF[eom2,coupling2,supportzinput,opticyawoutput,0.1,100]
```



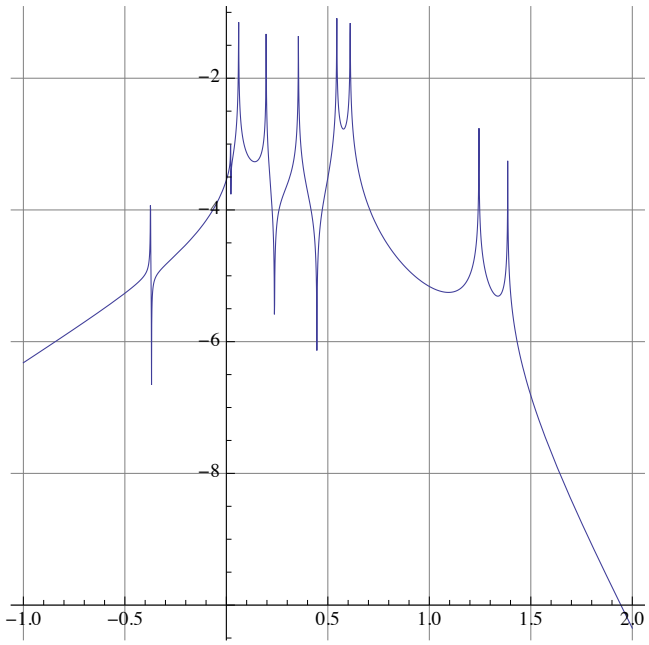
z to pitch

```
plotTF[eom2,coupling2,supportzinput,opticpitchoutput,0.1,100]
```



z to roll

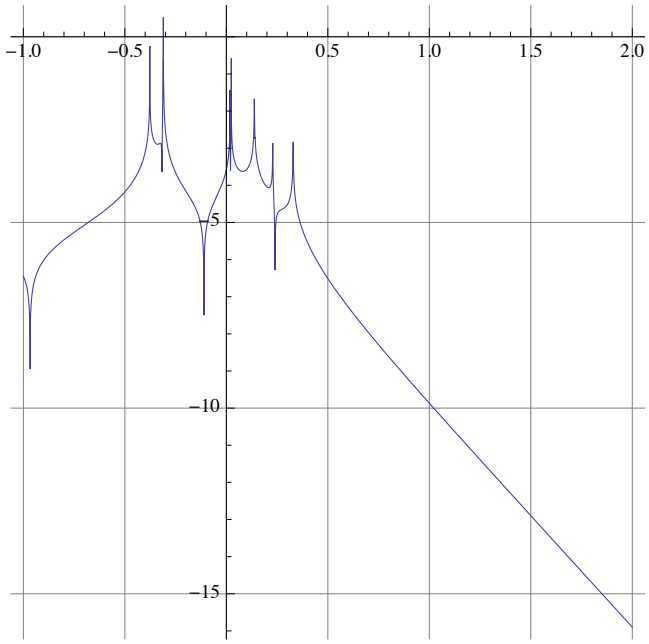
```
plotTF[eom2,coupling2,supportzinput,opticrolloutput,0.1,100]
```



- **yaw**

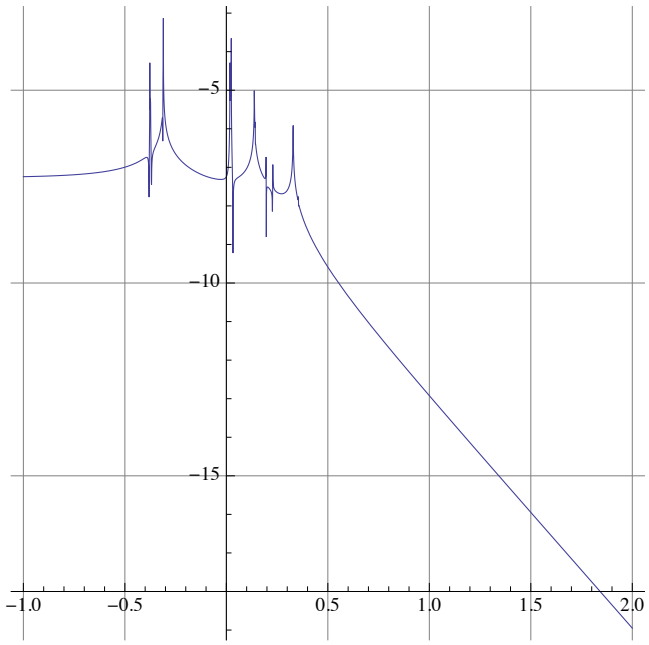
yaw to x

```
plotTF[eom2,coupling2,supportyawinput,opticxoutput,0.1,100]
```



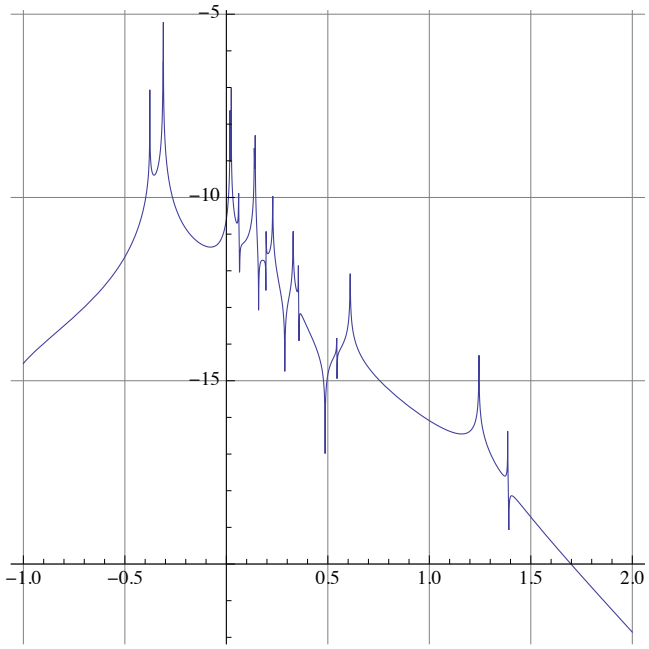
yaw to y

```
plotTF[eom2,coupling2,supportyawinput,opticyoutput,0.1,100]
```



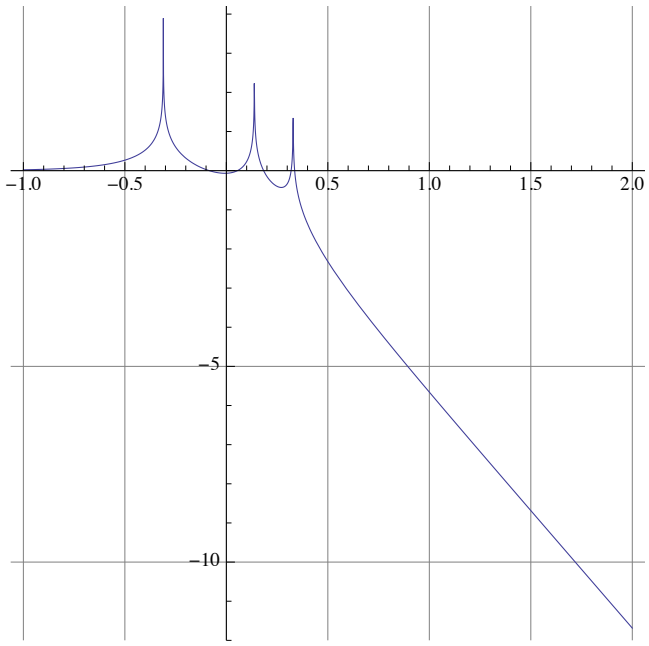
yaw to z

```
plotTF[eom2,coupling2,supportyawinput,opticzoutput,0.1,100]
```



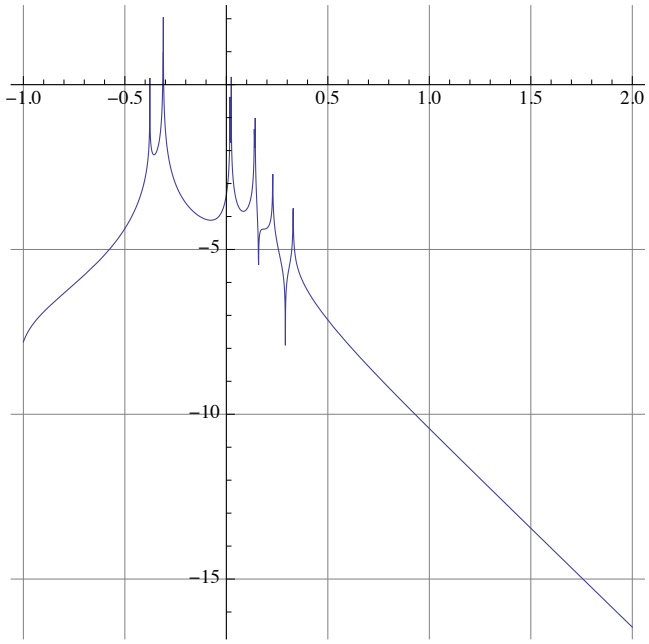
yaw to yaw

```
plotTF[eom2,coupling2,supportyawinput,opticyawoutput,0.1,100]
```



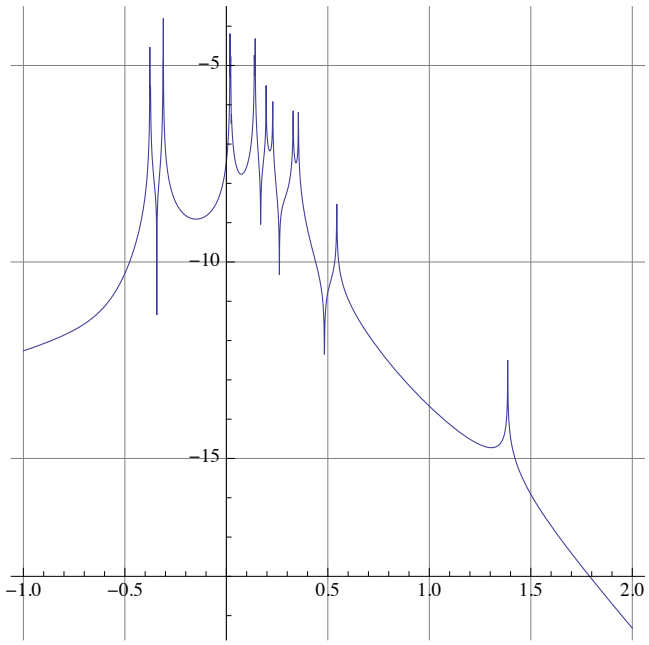
yaw to pitch

```
plotTF[eom2,coupling2,supportyawinput,opticpitchoutput,0.1,100]
```



yaw to roll

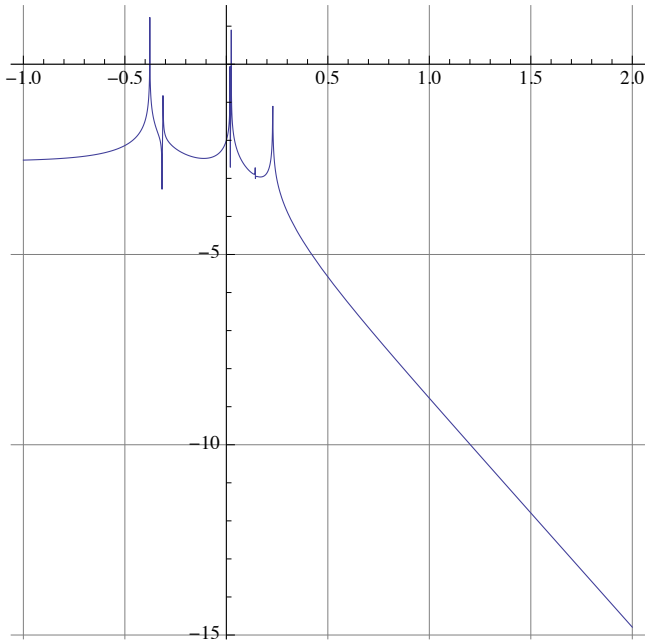
```
plotTF[eom2,coupling2,supportyawinput,opticrolloutput,0.1,100]
```



- **pitch**

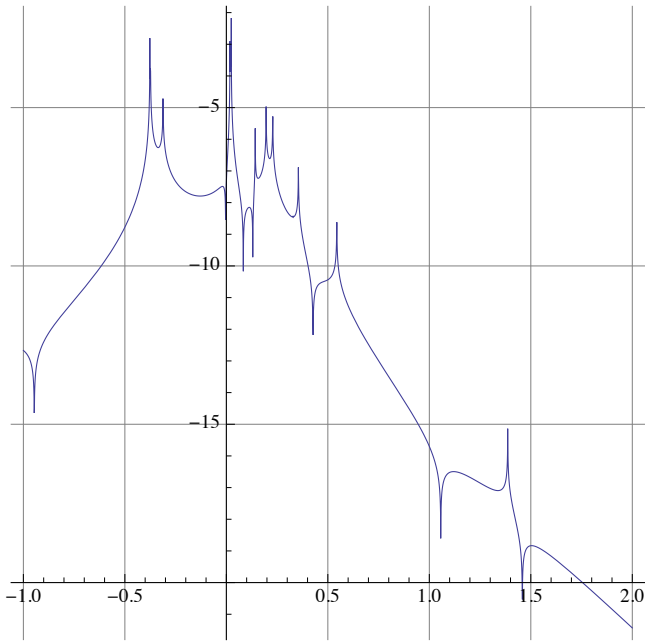
pitch to x

```
plotTF[eom2,coupling2,supportpitchinput,opticxoutput,0.1,100]
```



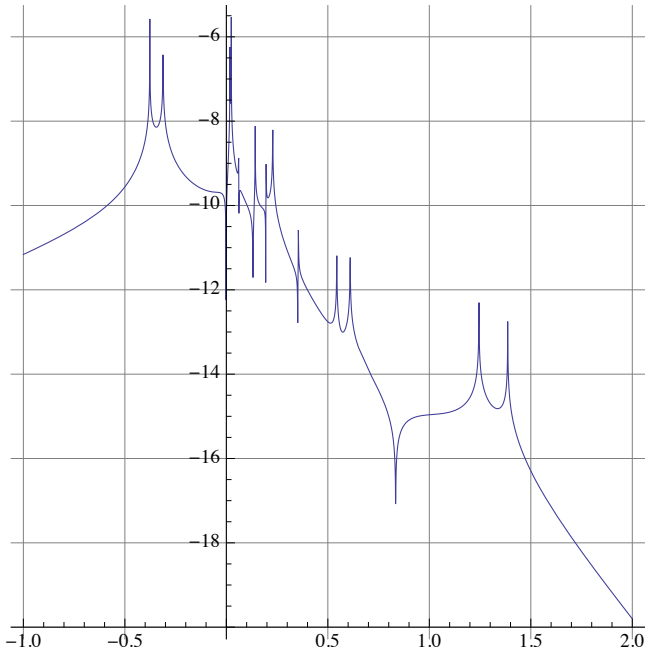
pitch to y

```
plotTF[eom2,coupling2,supportpitchinput,opticyoutput,0.1,100]
```



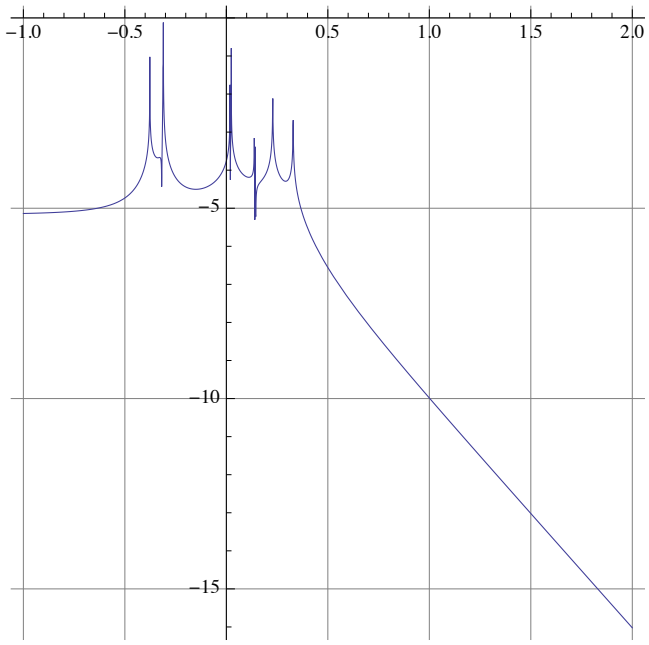
pitch to z

```
plotTF[eom2,coupling2,supportpitchinput,opticzoutput,0.1,100]
```



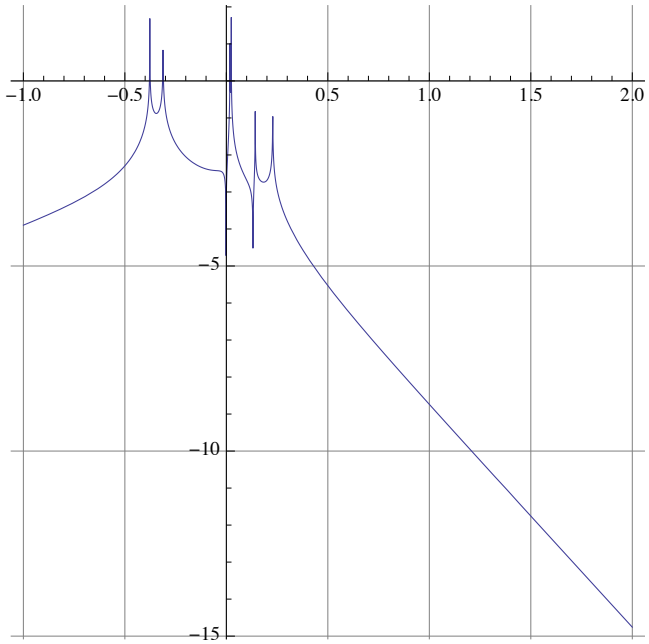
pitch to yaw

```
plotTF[eom2,coupling2,supportpitchinput,opticyawoutput,0.1,100]
```



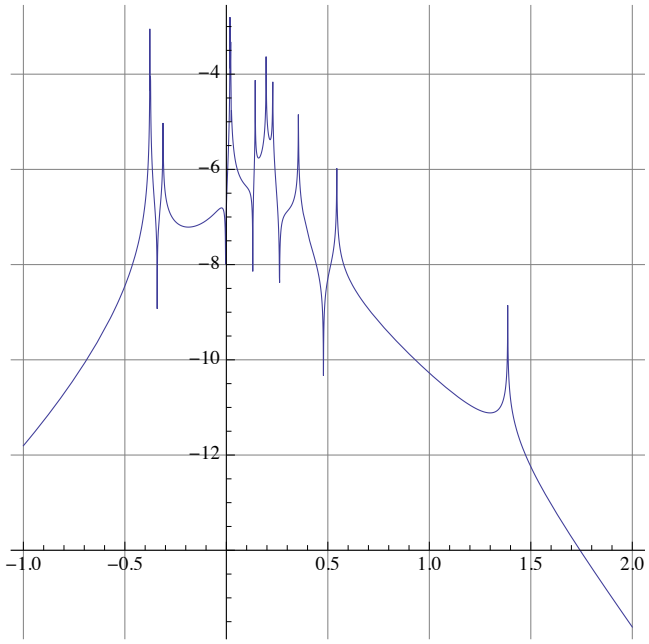
pitch to pitch

```
plotTF[eom2,coupling2,supportpitchinput,opticpitchoutput,0.1,100]
```



pitch to roll

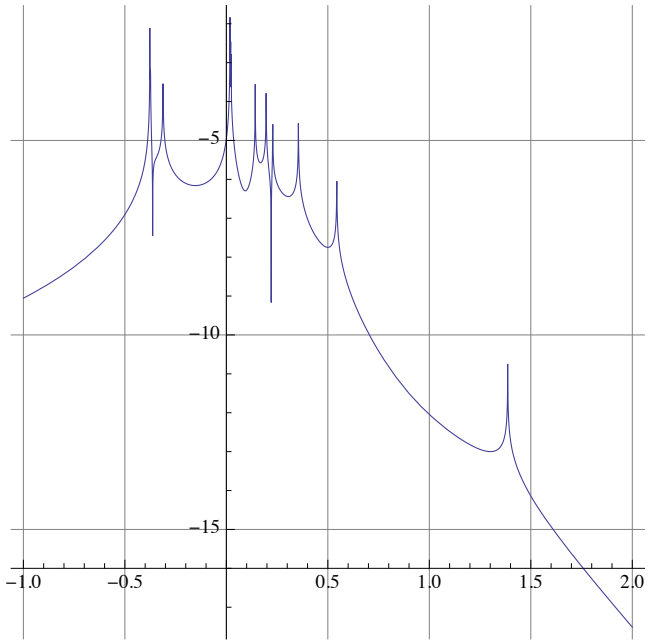
```
plotTF[eom2,coupling2,supportpitchinput,opticrolloutput,0.1,100]
```



- **roll**

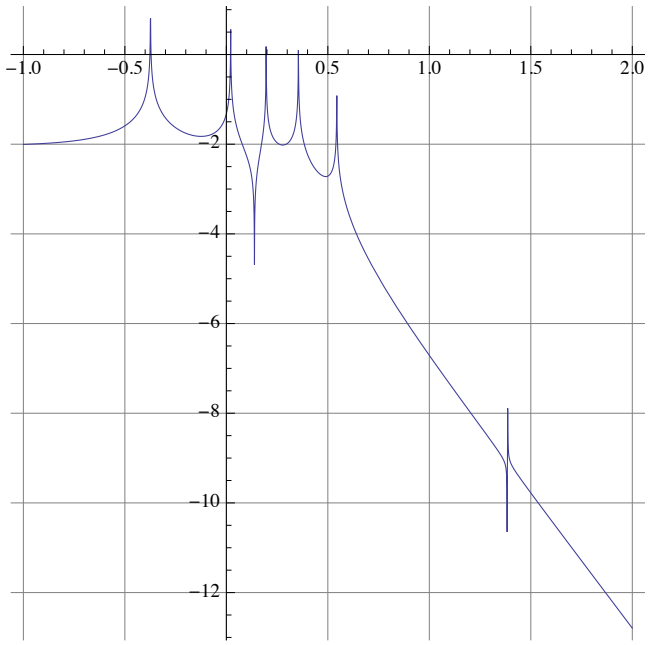
roll to x

```
plotTF[eom2,coupling2,supportrollinput,opticxoutput,0.1,100]
```



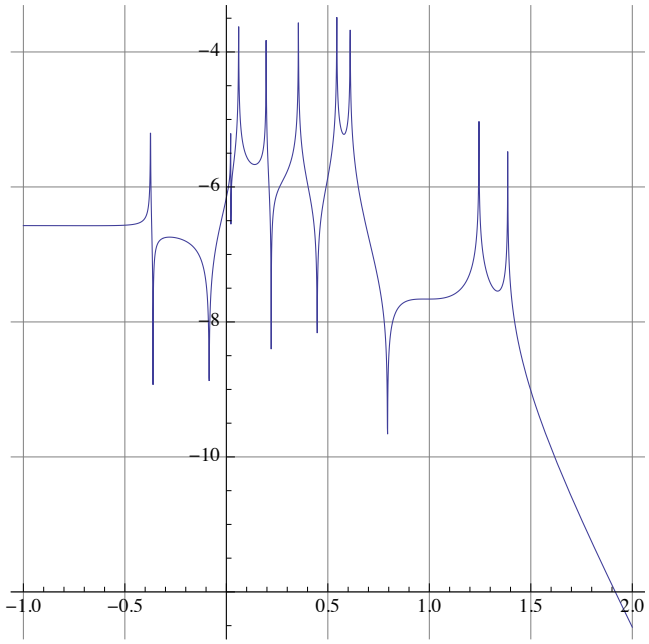
roll to y

```
plotTF[eom2,coupling2,supportrollinput,opticyoutput,0.1,100]
```



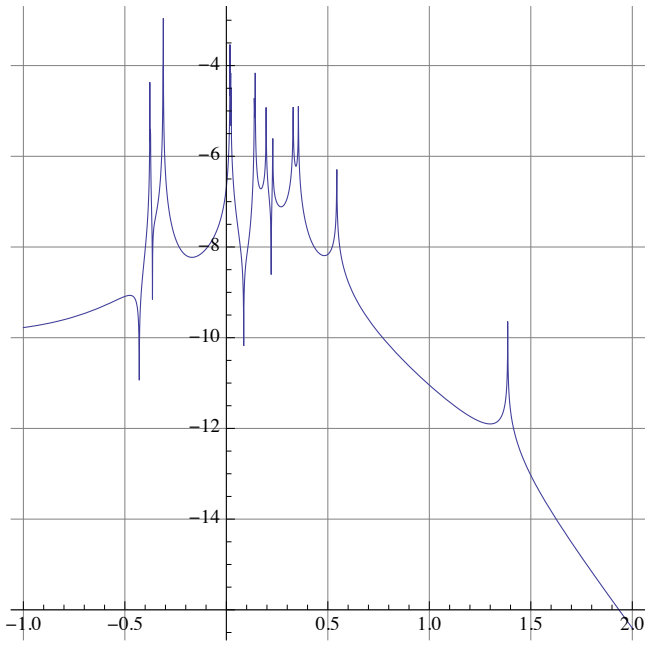
roll to z

```
plotTF[eom2,coupling2,supportrollinput,opticzoutput,0.1,100]
```



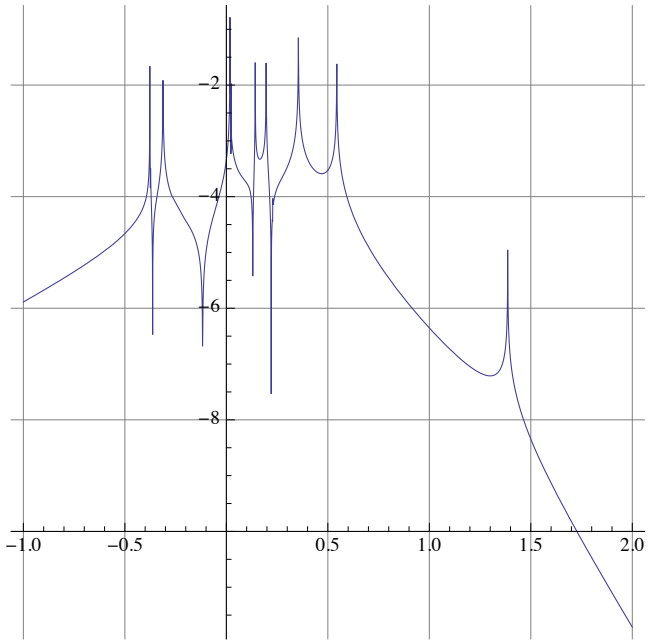
roll to yaw

```
plotTF[eom2,coupling2,supportrollinput,opticyawoutput,0.1,100]
```



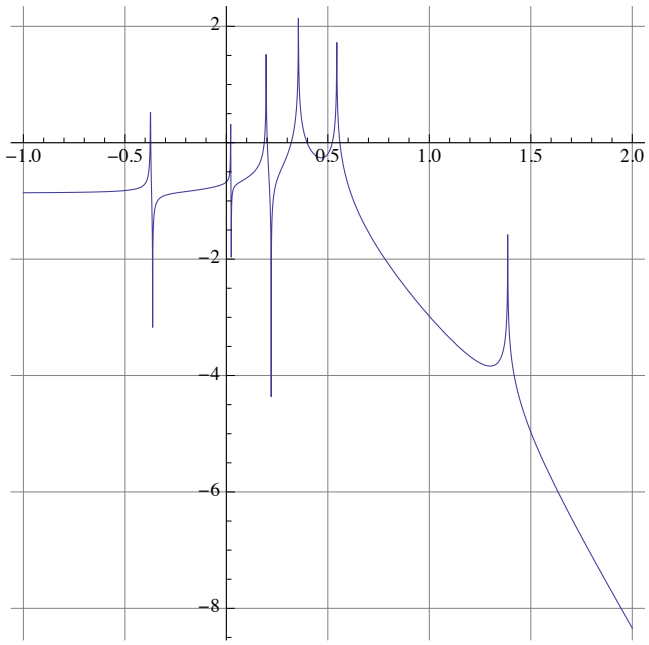
roll to pitch

```
plotTF[eom2,coupling2,supportrollinput,opticpitchoutput,0.1,100]
```



roll to roll

```
plotTF[eom2,coupling2,supportrollinput,opticrolloutput,0.1,100]
```

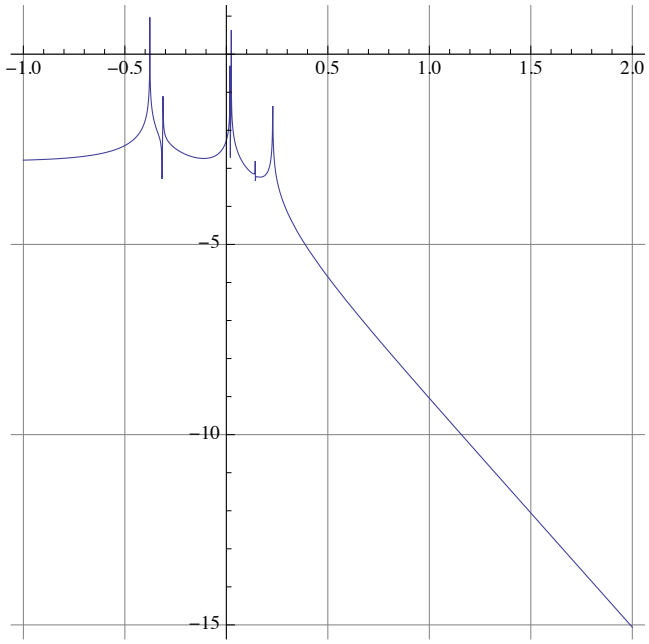


■ Top mass force/torque to optic displacement transfer function plots

■ x

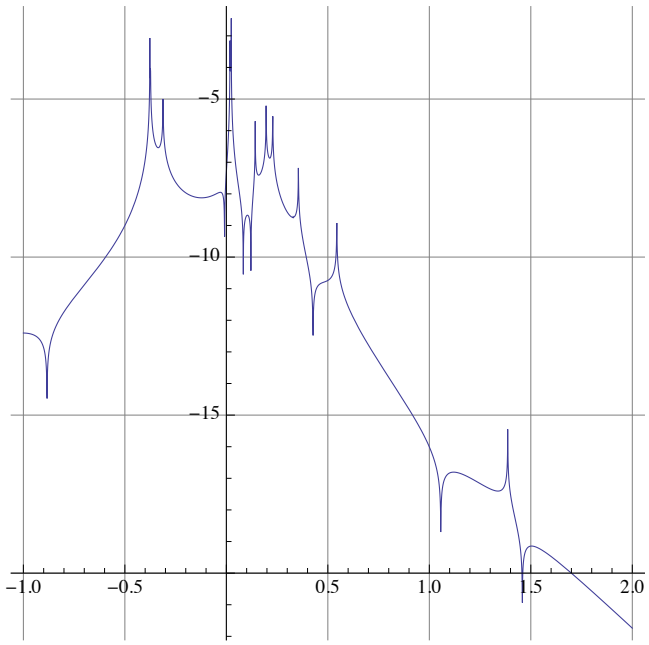
x to x

```
plotTFf[eom2,makefinputvector[x1],opticxoutput,0.1,100]
```



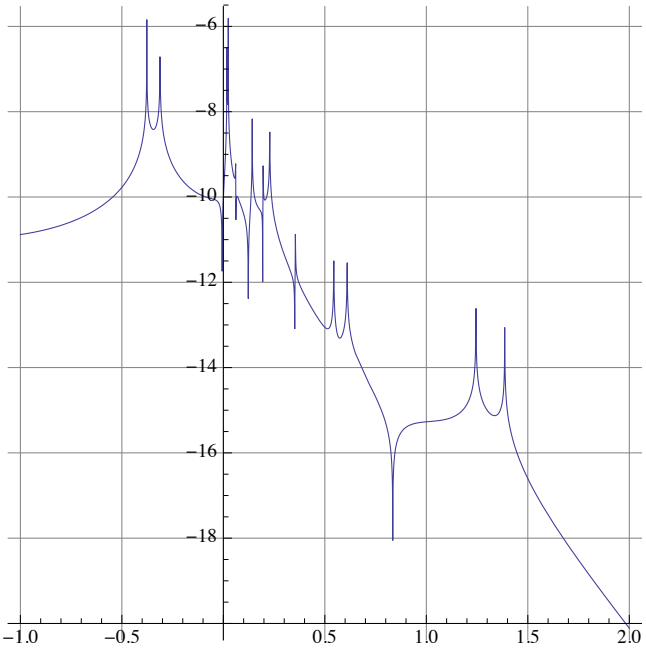
x to y

```
plotTFf[eom2,makefinputvector[x1],opticyoutput,0.1,100]
```



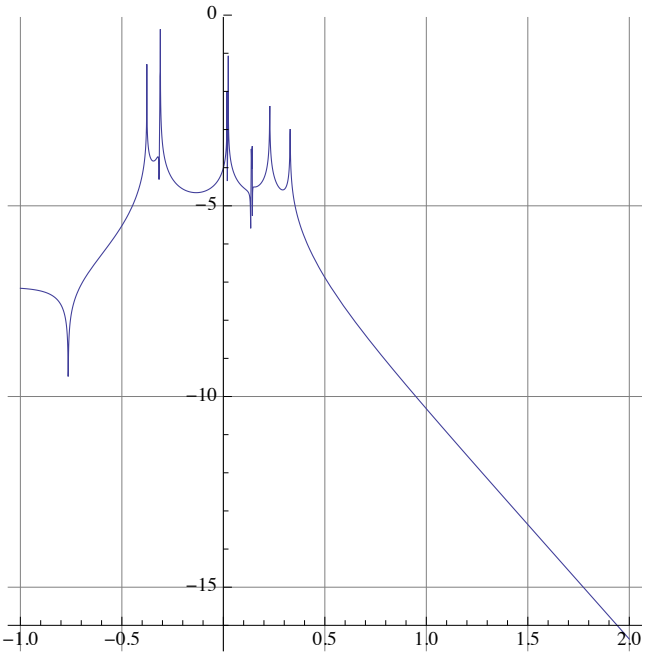
x to z

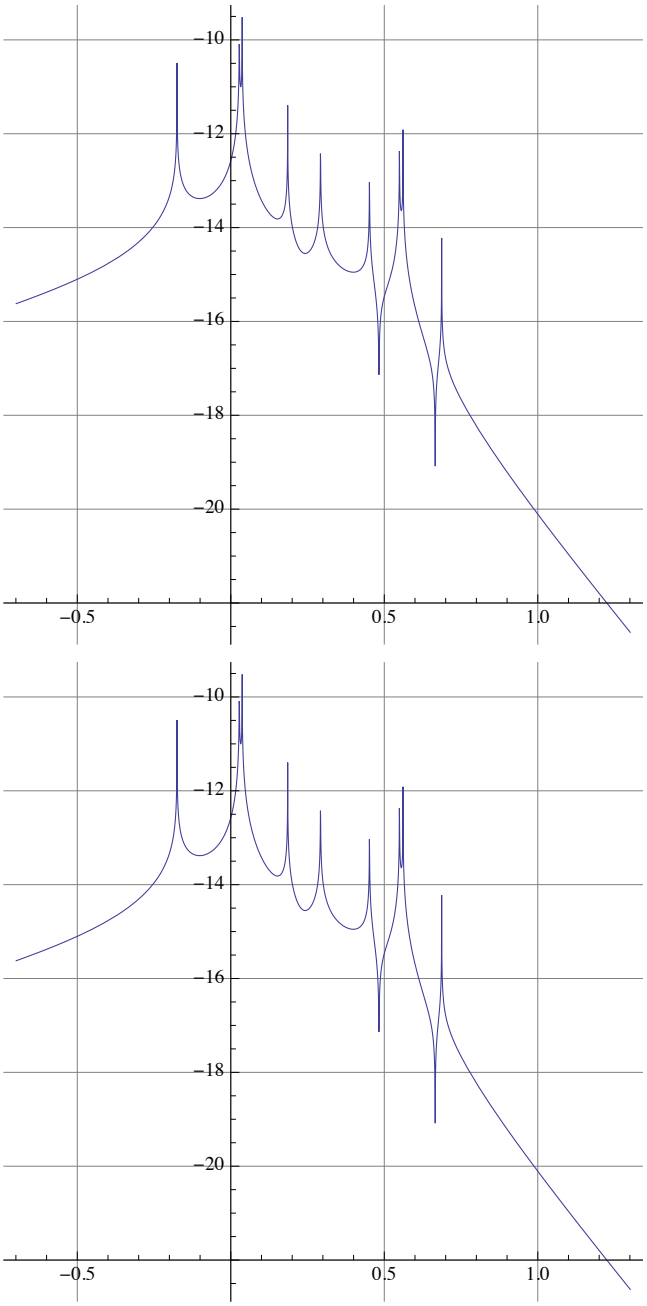
```
plotTFf[eom2,makefinputvector[x1],opticzoutput,0.1,100]
```



x to yaw

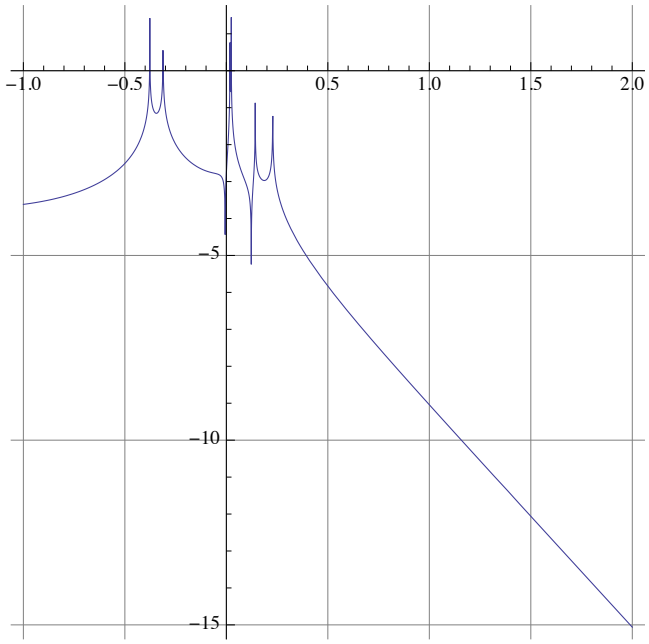
```
plotTFf[eom2,makefinputvector[x1],opticyawoutput,0.1,100]
```





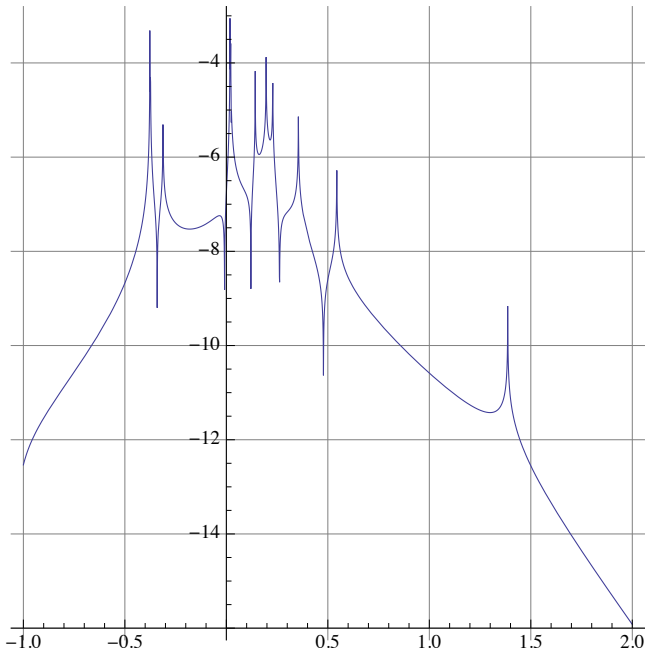
x to pitch

```
plotTFf[eom2,makefinputvector[x1],opticpitchoutput,0.1,100]
```



x to roll

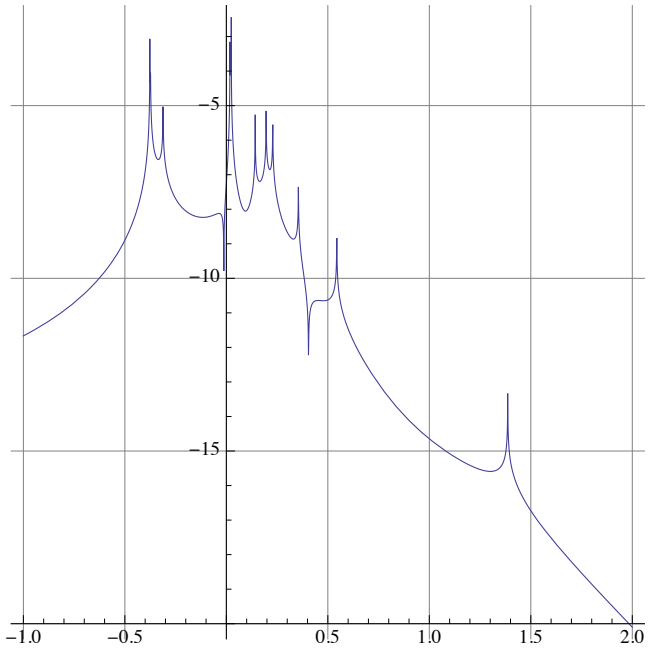
```
plotTFf[eom2,makefinputvector[x1],opticrolloutput,0.1,100]
```



■ y

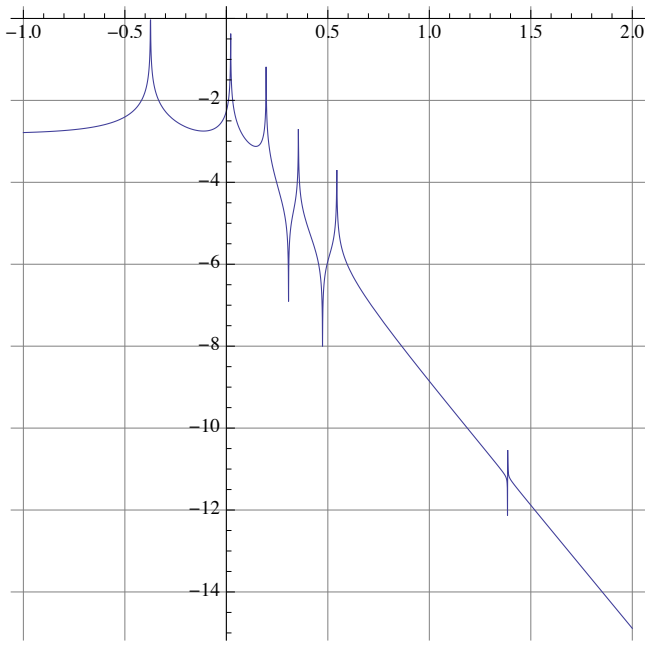
y to x

```
plotTFf[eom2,makefinputvector[y1],opticxoutput,0.1,100]
```



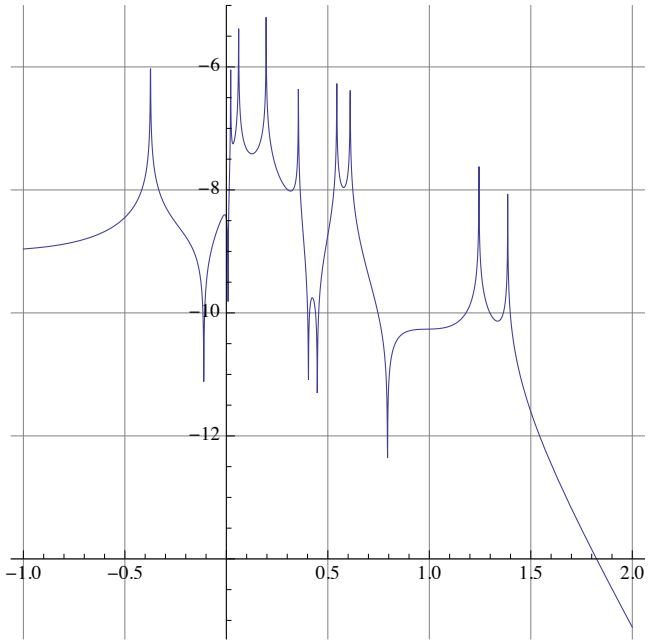
y to y

```
plotTFf[eom2,makefinputvector[y1],opticyoutput,0.1,100]
```



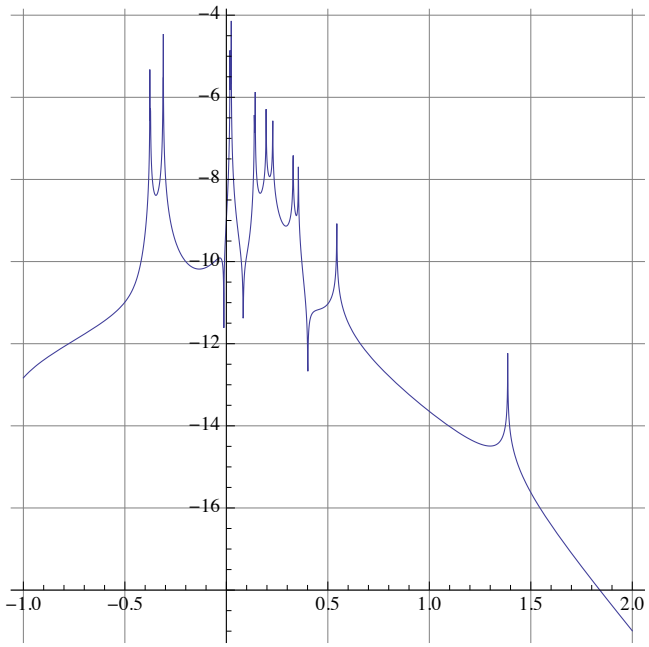
y to z

```
plotTFf[eom2,makefinputvector[y1],opticzoutput,0.1,100]
```



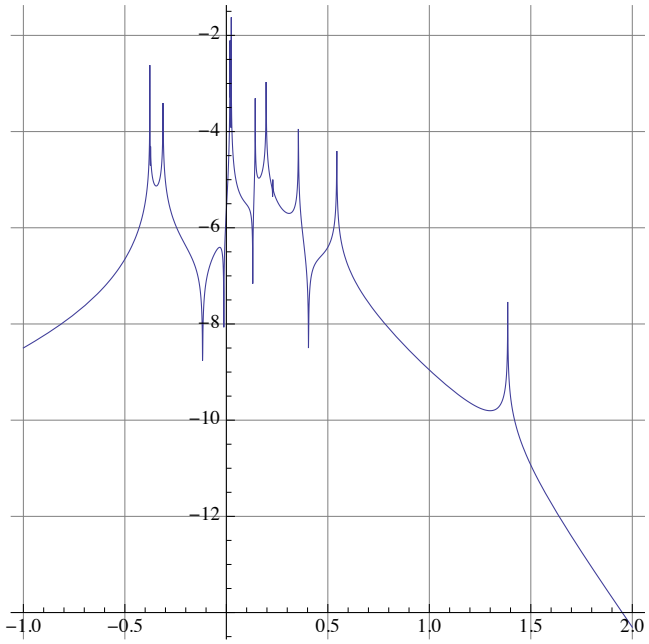
y to yaw

```
plotTFf[eom2,makefinputvector[y1],opticyawoutput,0.1,100]
```



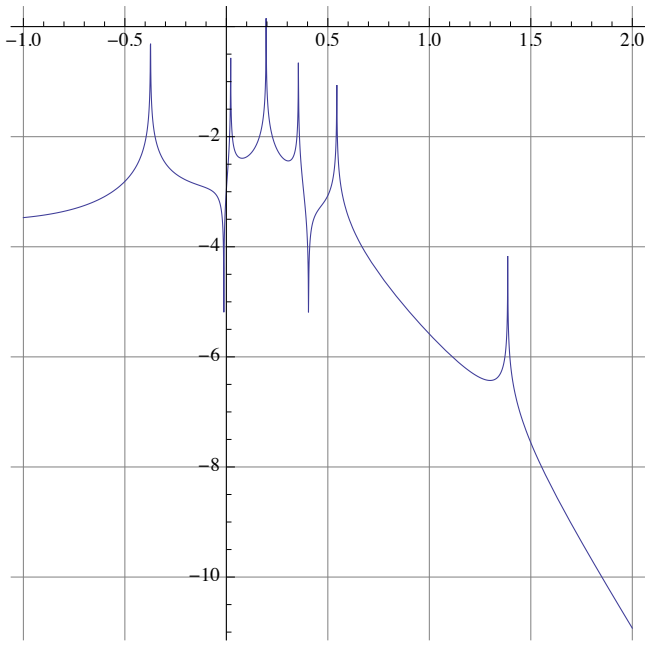
y to pitch

```
plotTFf[eom2,makefinputvector[y1],opticpitchoutput,0.1,100]
```



y to roll

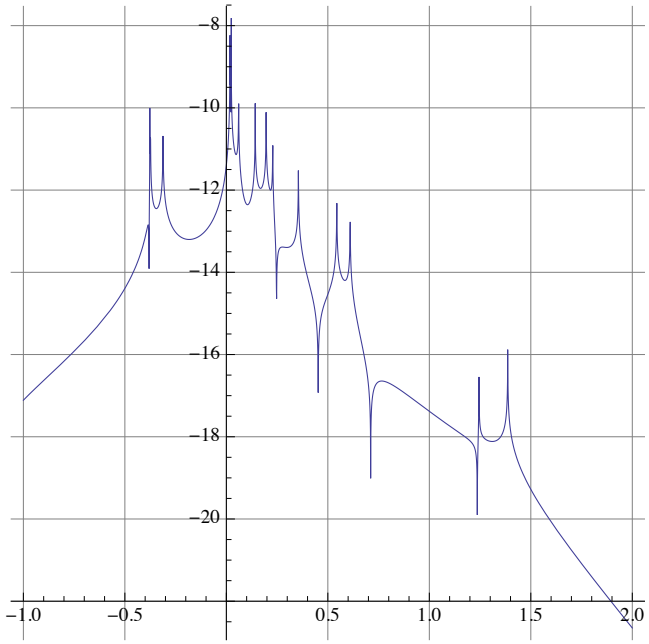
```
plotTFf[eom2,makefinputvector[y1],opticrolloutput,0.1,100]
```



- **z**

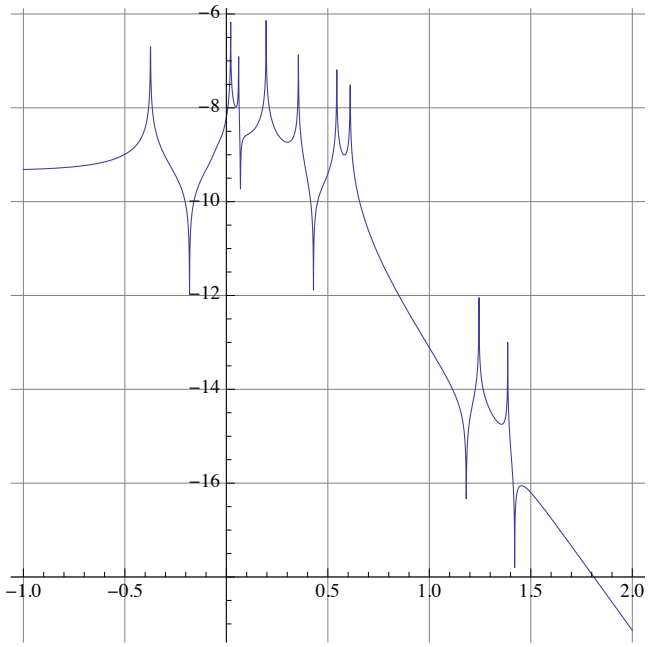
z to x

```
plotTFf[eom2,makefinputvector[z1],opticxoutput,0.1,100]
```



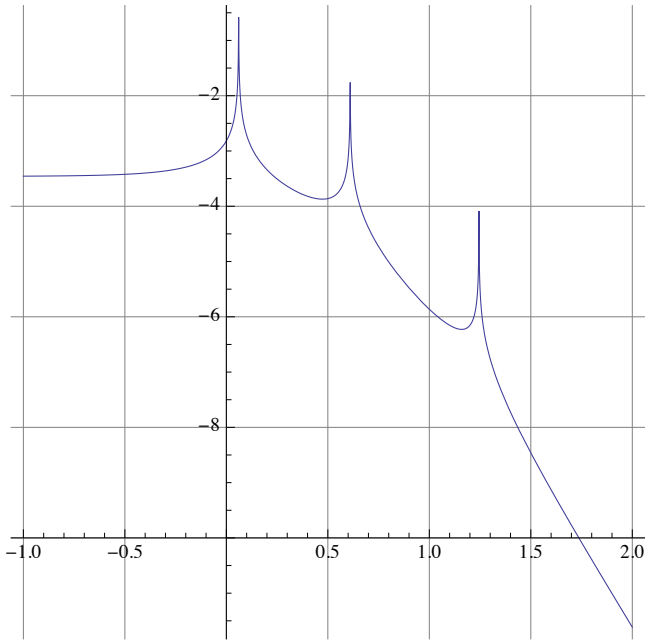
z to y

```
plotTFf[eom2,makefinputvector[z1],opticyoutput,0.1,100]
```



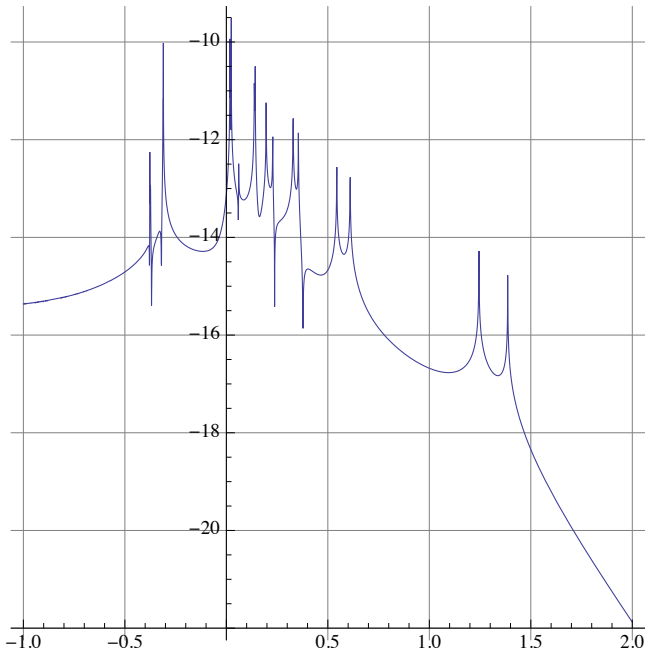
z to z

```
plotTFf[eom2,makefinputvector[z1],opticzoutput,0.1,100]
```



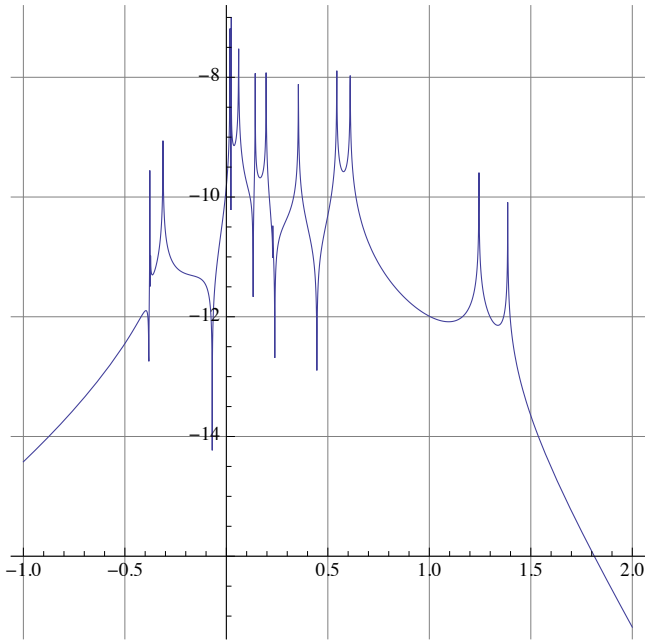
z to yaw

```
plotTFf[eom2,makefinputvector[z1],opticyawoutput,0.1,100]
```



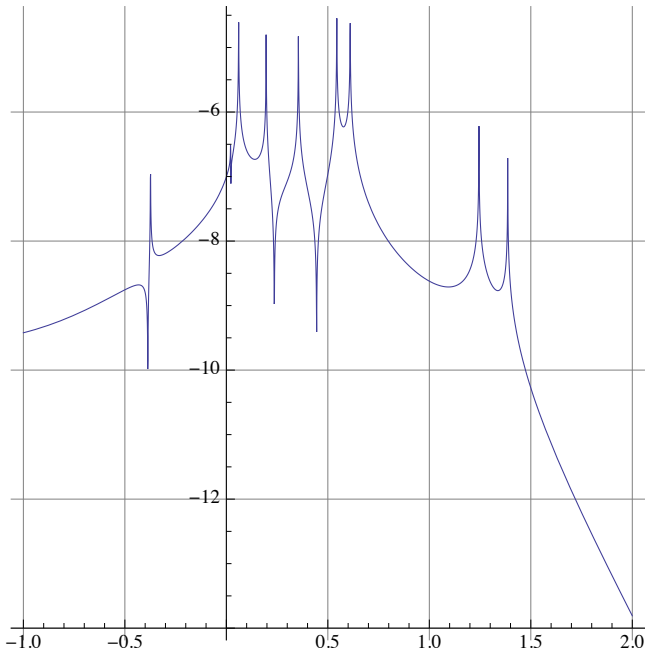
z to pitch

```
plotTFf[eom2,makefinputvector[z1],opticpitchoutput,0.1,100]
```



z to roll

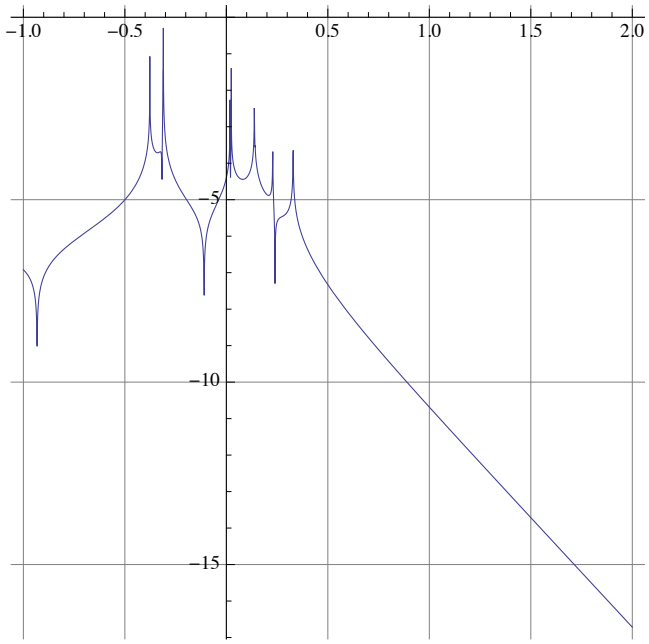
```
plotTFf[eom2,makefinputvector[z1],opticrolloutput,0.1,100]
```



- **yaw**

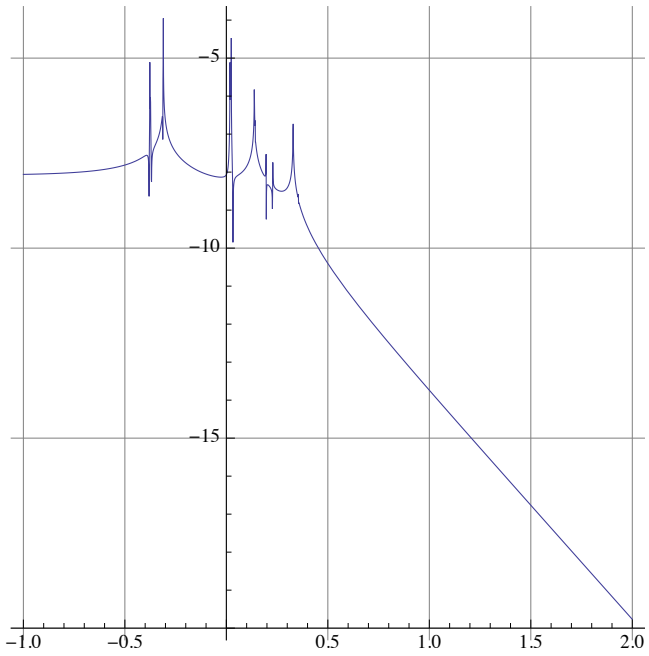
yaw to x

```
plotTFf[eom2,makefinputvector[yaw1],opticxoutput,0.1,100]
```



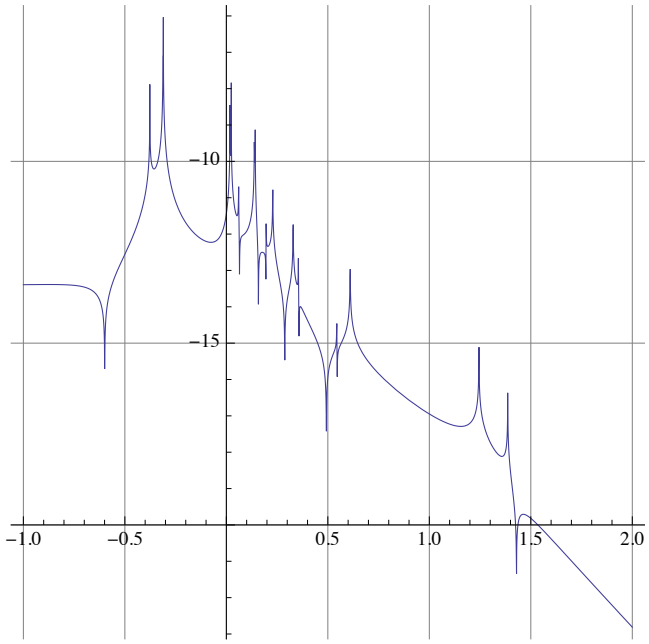
yaw to y

```
plotTFf[eom2,makefinputvector[yaw1],opticyoutput,0.1,100]
```



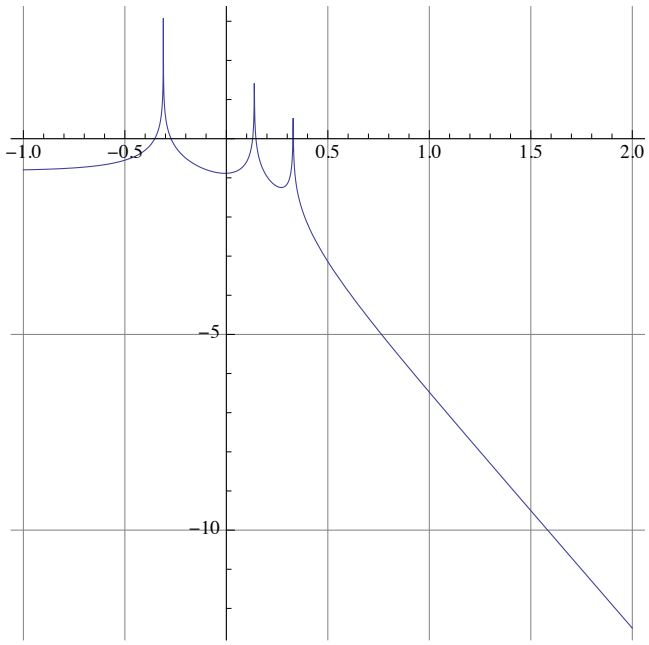
yaw to z

```
plotTFf[eom2,makefinputvector[yaw1],opticzoutput,0.1,100]
```



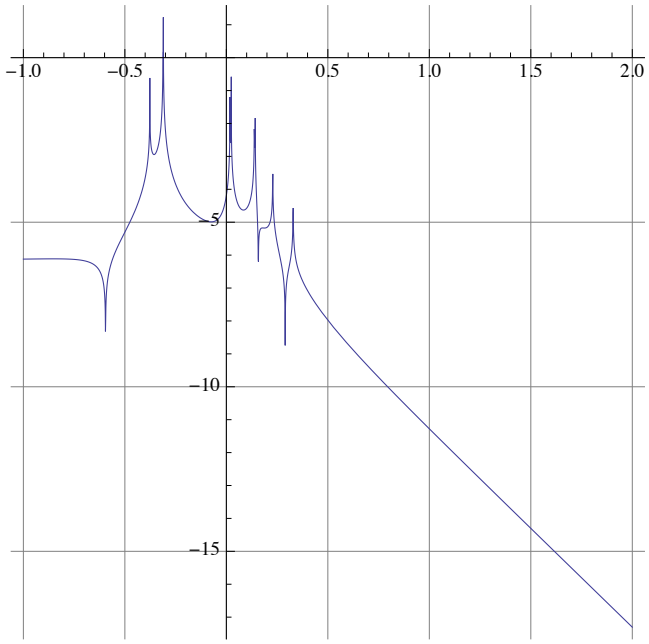
yaw to yaw

```
plotTFf[eom2,makefinputvector[yaw1],opticyawoutput,0.1,100]
```



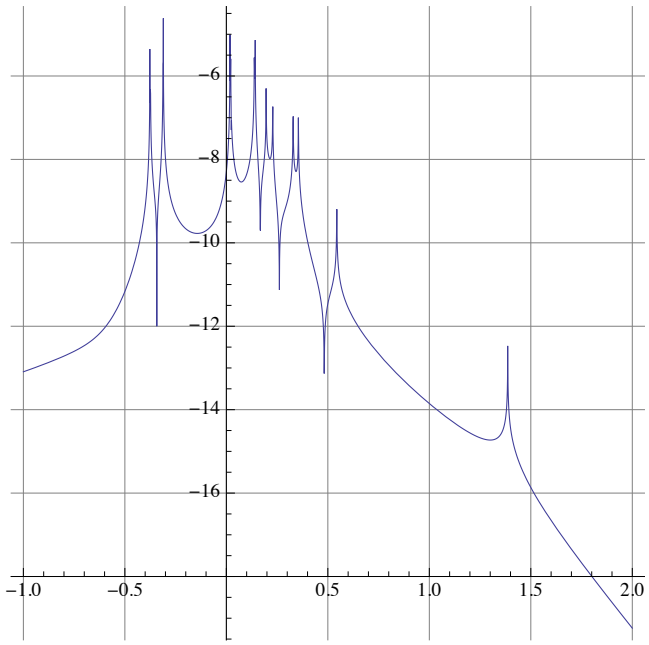
yaw to pitch

```
plotTFf[eom2,makefinputvector[yaw1],opticpitchoutput,0.1,100]
```



yaw to roll

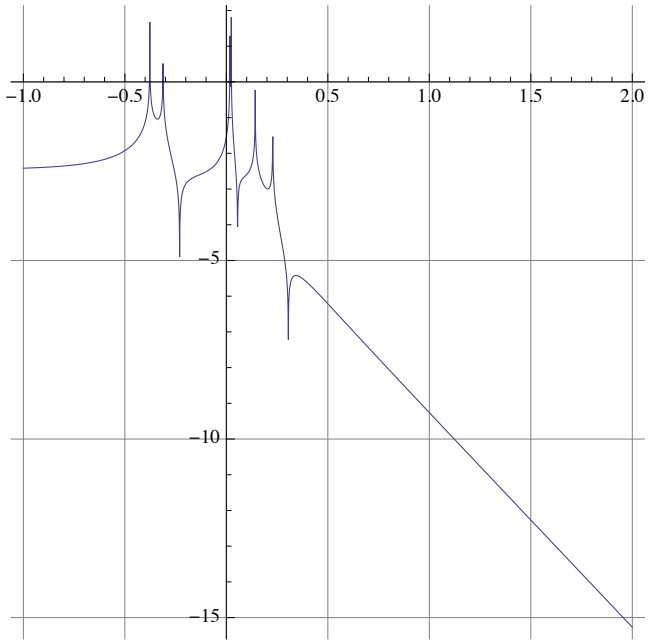
```
plotTFf[eom2,makefinputvector[yaw1],opticrolloutput,0.1,100]
```



- **pitch**

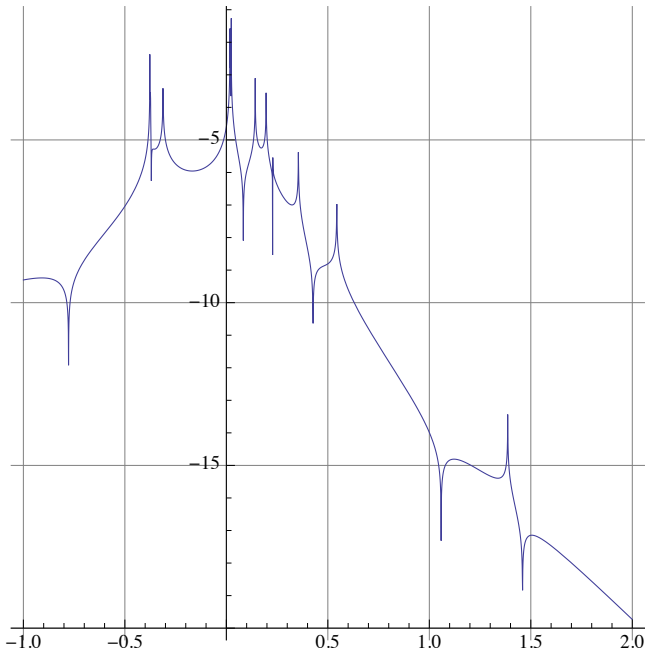
pitch to x

```
plotTFf[eom2,makefinputvector[pitch1],opticxoutput,0.1,100]
```



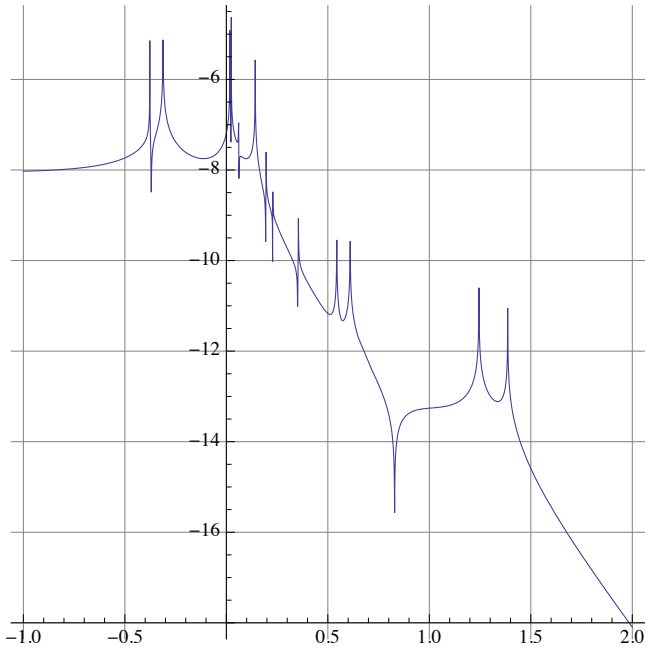
pitch to y

```
plotTFf[eom2,makefinputvector[pitch1],opticyoutput,0.1,100]
```



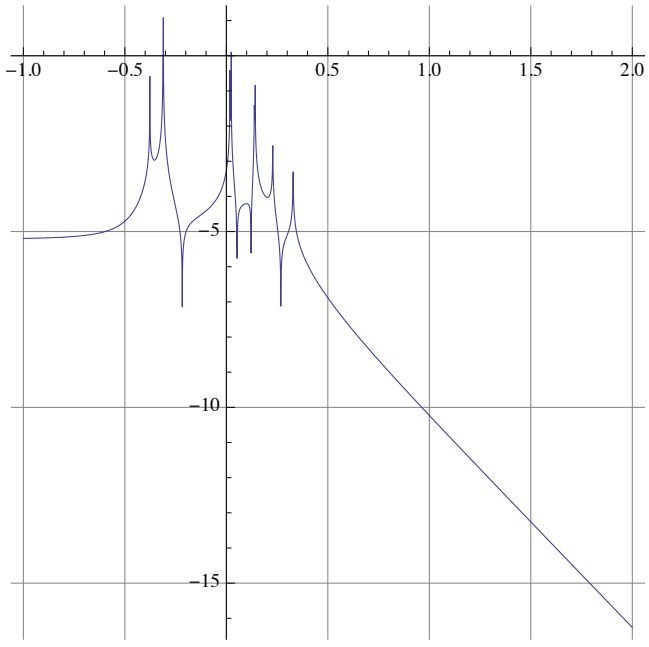
pitch to z

```
plotTFf[eom2,makefinputvector[pitch1],opticzoutput,0.1,100]
```



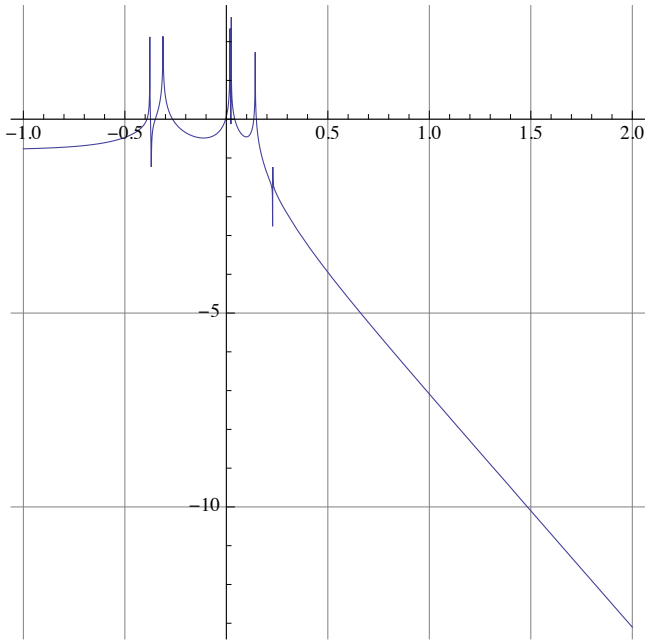
pitch to yaw

```
plotTFf[eom2,makefinputvector[pitch1],opticyawoutput,0.1,100]
```



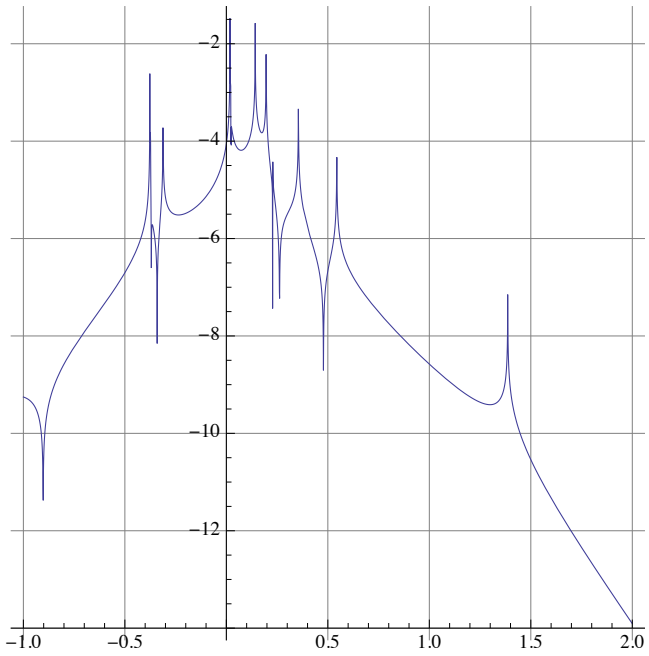
pitch to pitch

```
plotTFf[eom2,makefinputvector[pitch1],opticpitchoutput,0.1,100]
```



pitch to roll

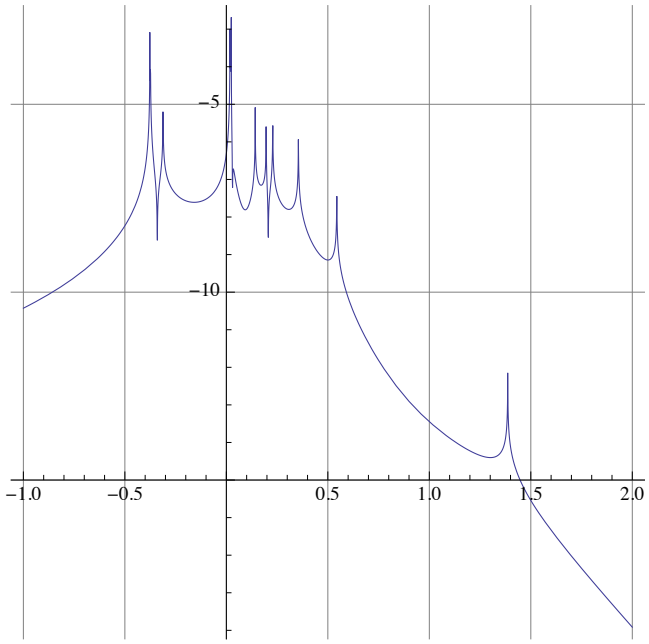
```
plotTFf[eom2,makefinputvector[pitch1],opticrolloutput,0.1,100]
```



- **roll**

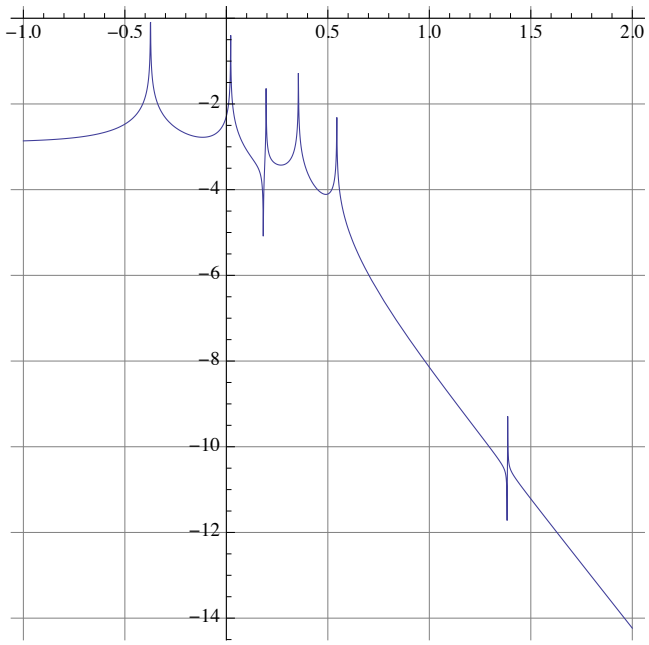
roll to x

```
plotTFf[eom2,makefinputvector[roll1],opticxoutput,0.1,100]
```



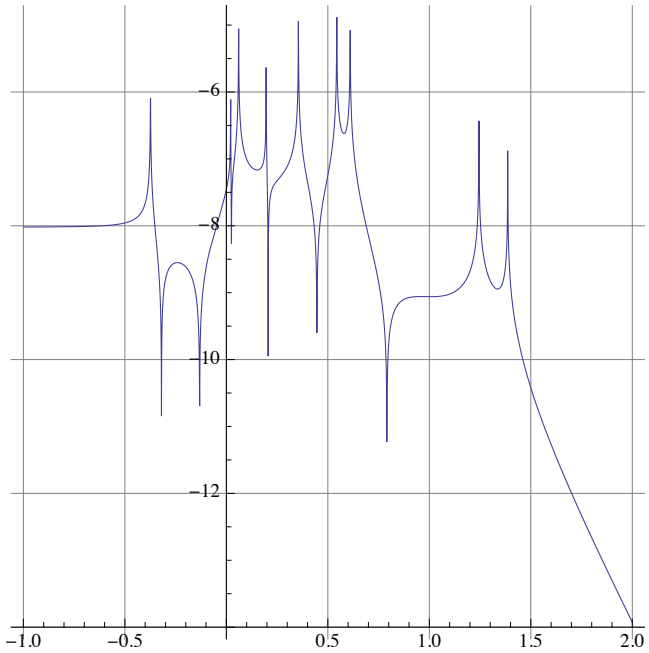
roll to y

```
plotTFf[eom2,makefinputvector[roll1],opticyoutput,0.1,100]
```



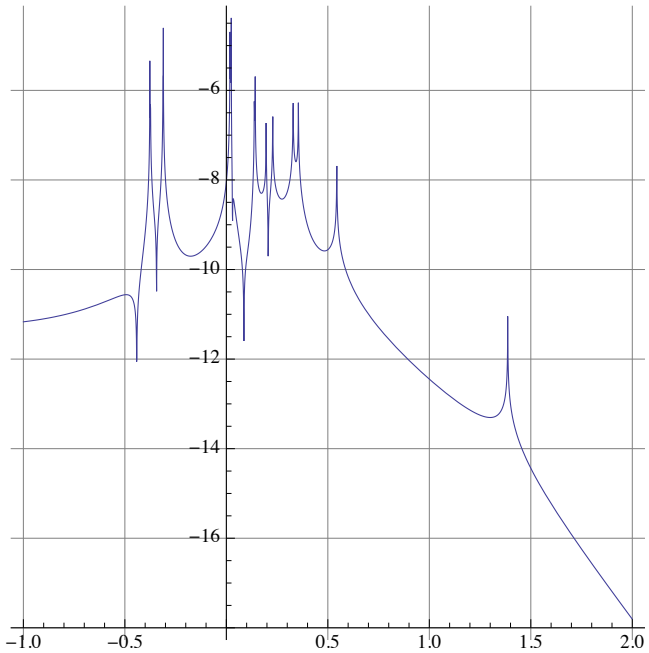
roll to z

```
plotTFf[eom2,makefinputvector[roll1],opticzoutput,0.1,100]
```



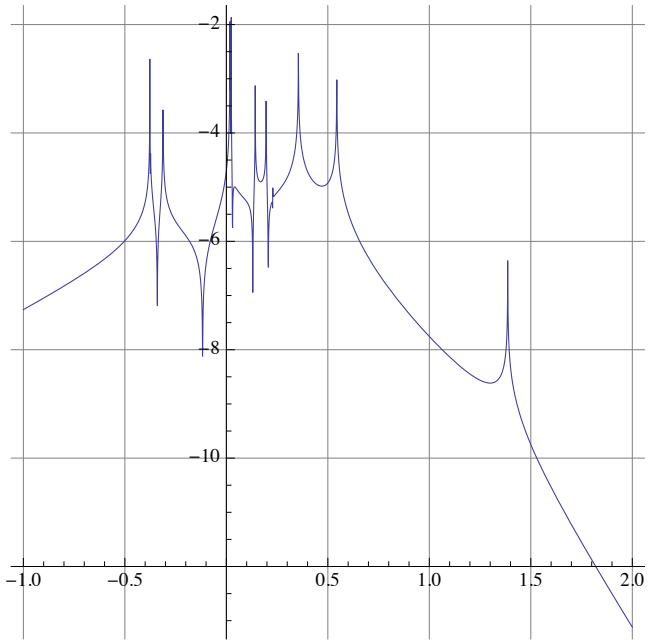
roll to yaw

```
plotTFf[eom2,makefinputvector[roll1],opticyawoutput,0.1,100]
```



roll to pitch

```
plotTFf[eom2,makefinputvector[roll1],opticpitchoutput,0.1,100]
```



roll to roll

```
plotTFf[eom2,makefinputvector[roll1],opticrolloutput,0.1,100]
```