Target Shielding Update

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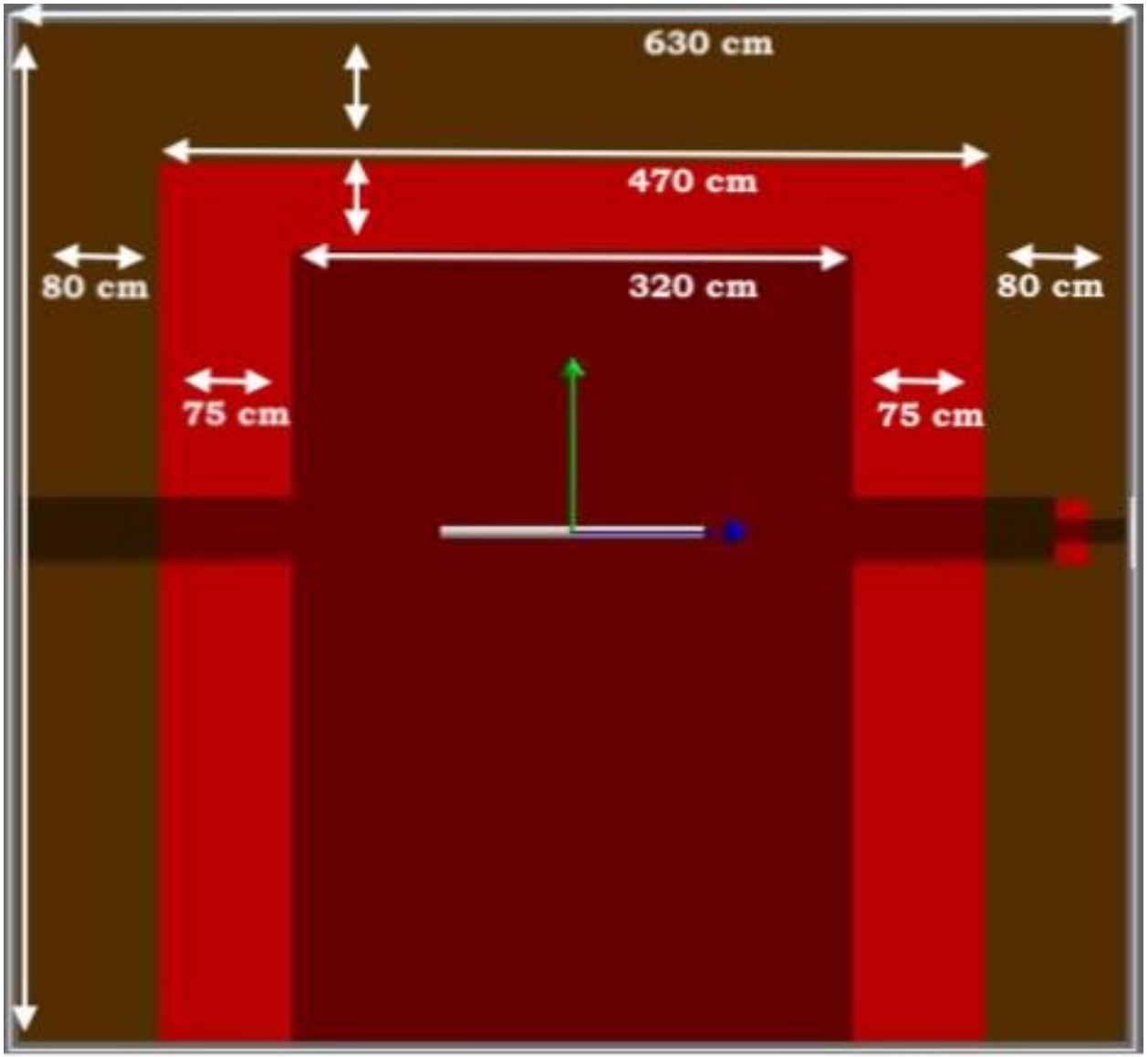
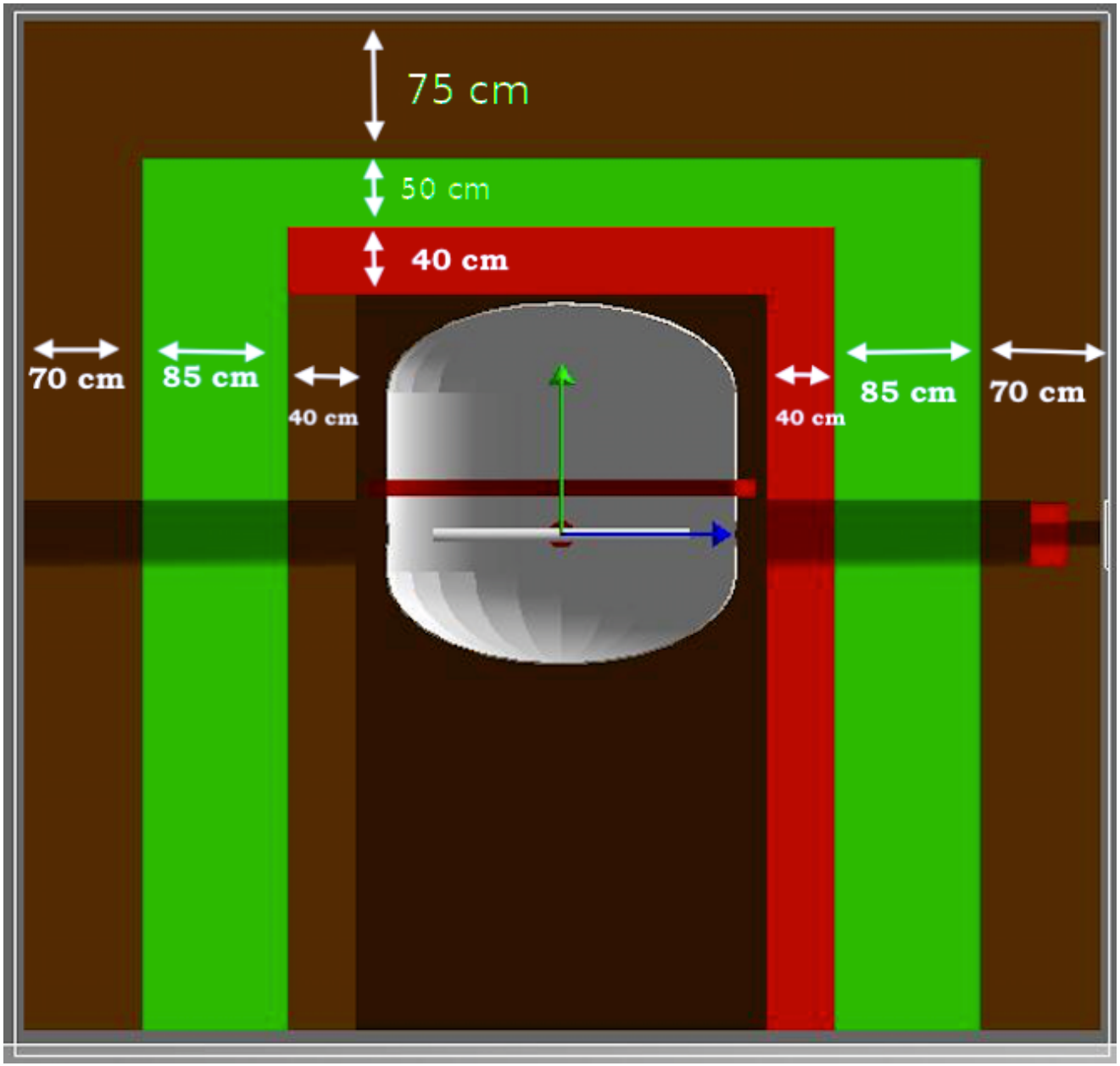
Initial Lead Shielding Design



Optimized Target Shielding



Change in Total Materials

Material	Before (Kg)	After (Kg)	Change (%)
Concrete	0	203387	100
Poly	127265	132065	4
Lead	854611	150202	-82

Radiation Comparison

Initial Design			
Total Radiation Flux to the hall (Hz/uA)			
Type	E range	Hall	Sky
	(MeV)	(Hz/uA)	(Hz/uA)
abs(electrons)	E<10	1.35E+10	4.61E+09
abs(electrons)	E>10	1.56E+10	1.06E+09
Photons	E<10	6.32E+11	3.40E+11
Photons	E>10	2.81E+10	9.27E+08
Neutrons	E<10	8.62E+09	6.17E+09
Neutrons	E>10	9.49E+07	7.24E+07

Ideal Design			
Total Radiation Flux to the hall (Hz/uA)			
Type	E range	Hall	Sky
	(MeV)	(Hz/uA)	(Hz/uA)
abs(electrons)	E<10	1.12E+10	4.31E+09
abs(electrons)	E>10	1.57E+10	1.08E+09
Photons	E<10	6.31E+11	3.40E+11
Photons	E>10	2.81E+10	8.94E+08
Neutrons	E<10	7.92E+09	6.11E+09
Neutrons	E>10	1.32E+08	8.11E+07

Initial Design			
Total Radiation Power to the hall (W/uA)			
Type	E range	Hall	Sky
	(MeV)	(W/uA)	(W/uA)
abs(electrons)	E<10	0.0058	0.0021
abs(electrons)	E>10	0.4849	0.0032
Photons	E<10	0.0950	0.0209
Photons	E>10	0.1924	0.0024
Neutrons	E<10	0.0002	0.0001
Neutrons	E>10	0.0015	0.0011

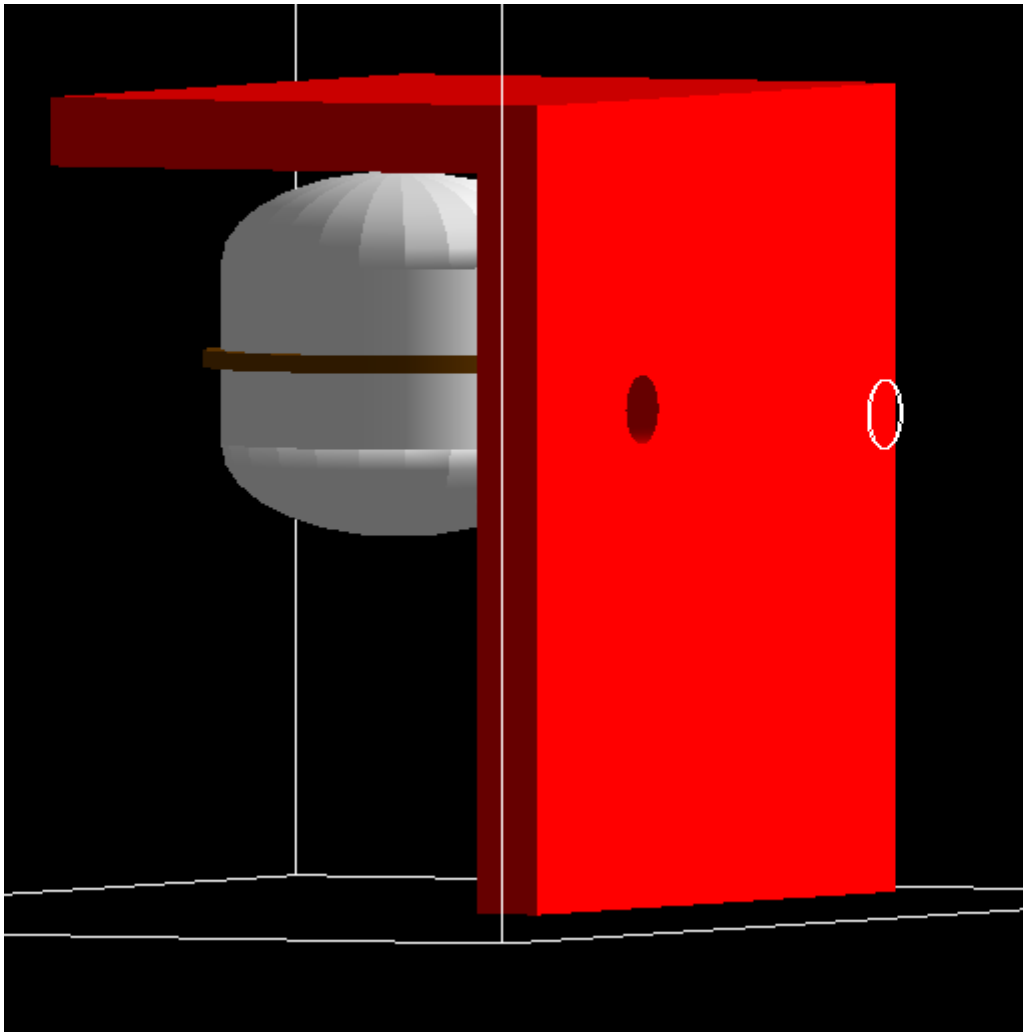
Ideal Design			
Total Radiation Power to the hall (W/uA)			
Type	E range	Hall	Sky
	(MeV)	(W/uA)	(W/uA)
abs(electrons)	E<10	0.0056	0.0019
abs(electrons)	E>10	0.4801	0.0032
Photons	E<10	0.0954	0.0213
Photons	E>10	0.1953	0.0025
Neutrons	E<10	0.0002	0.0001
Neutrons	E>10	0.0022	0.0014

Radiation Comparison

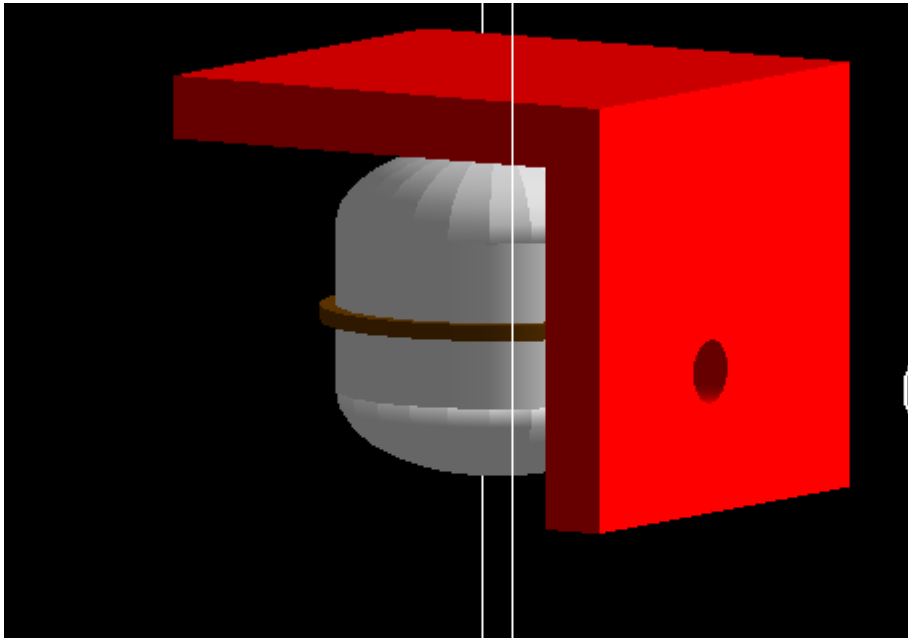
Percent Change in Flux wrt Initial Design			
Type	E range	Hall	Sky
	(MeV)	(%)	(%)
abs(electrons)	E<10	-17.2	-6.6
abs(electrons)	E>10	0.9	2.1
Photons	E<10	0.0	0.0
Photons	E>10	-0.1	-3.6
Neutrons	E<10	-8.2	-1.1
Neutrons	E>10	39.5	12.1

Change in Total Materials			
Material	Before (Kg)	After (Kg)	Change (%)
Concrete	0	203387	100
Poly	127265	132065	4
Lead	854611	150202	-82

Ideal Design



Optimized Design Bare Minimum

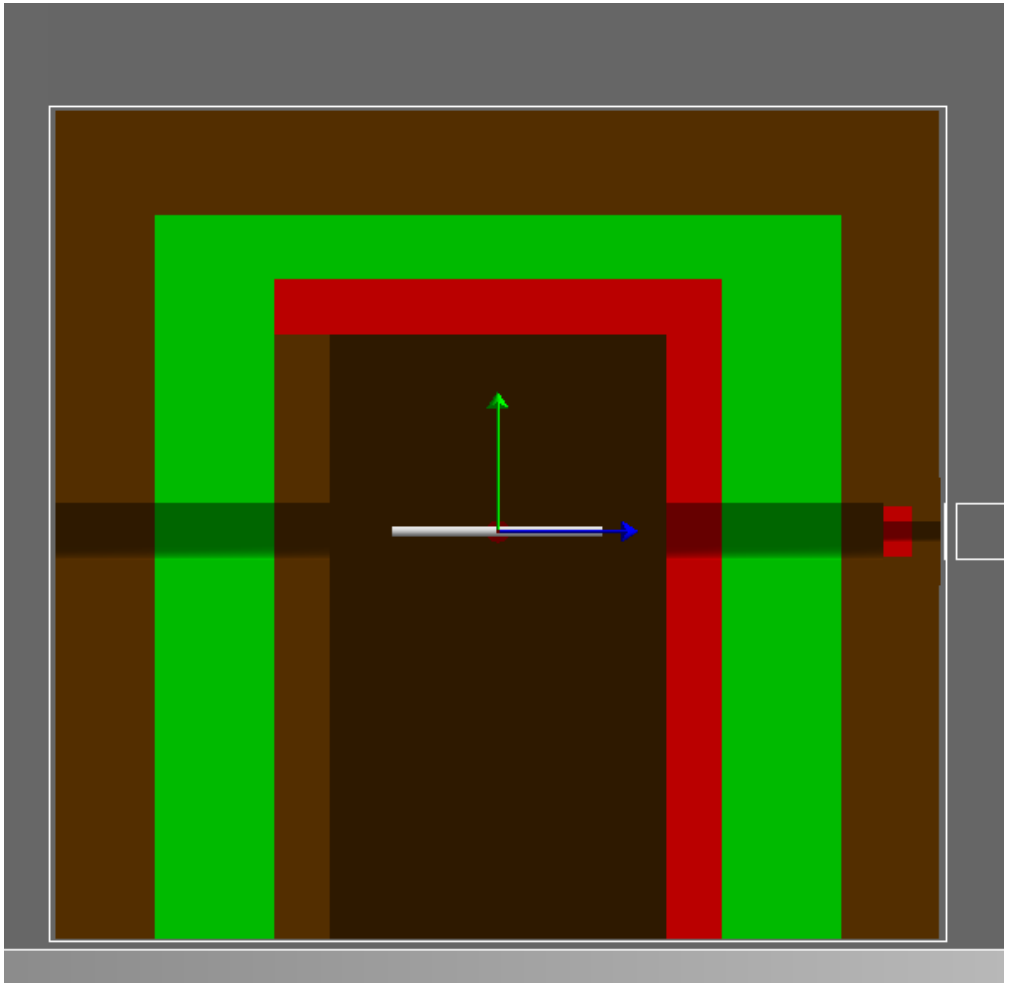


Radiation Comparison

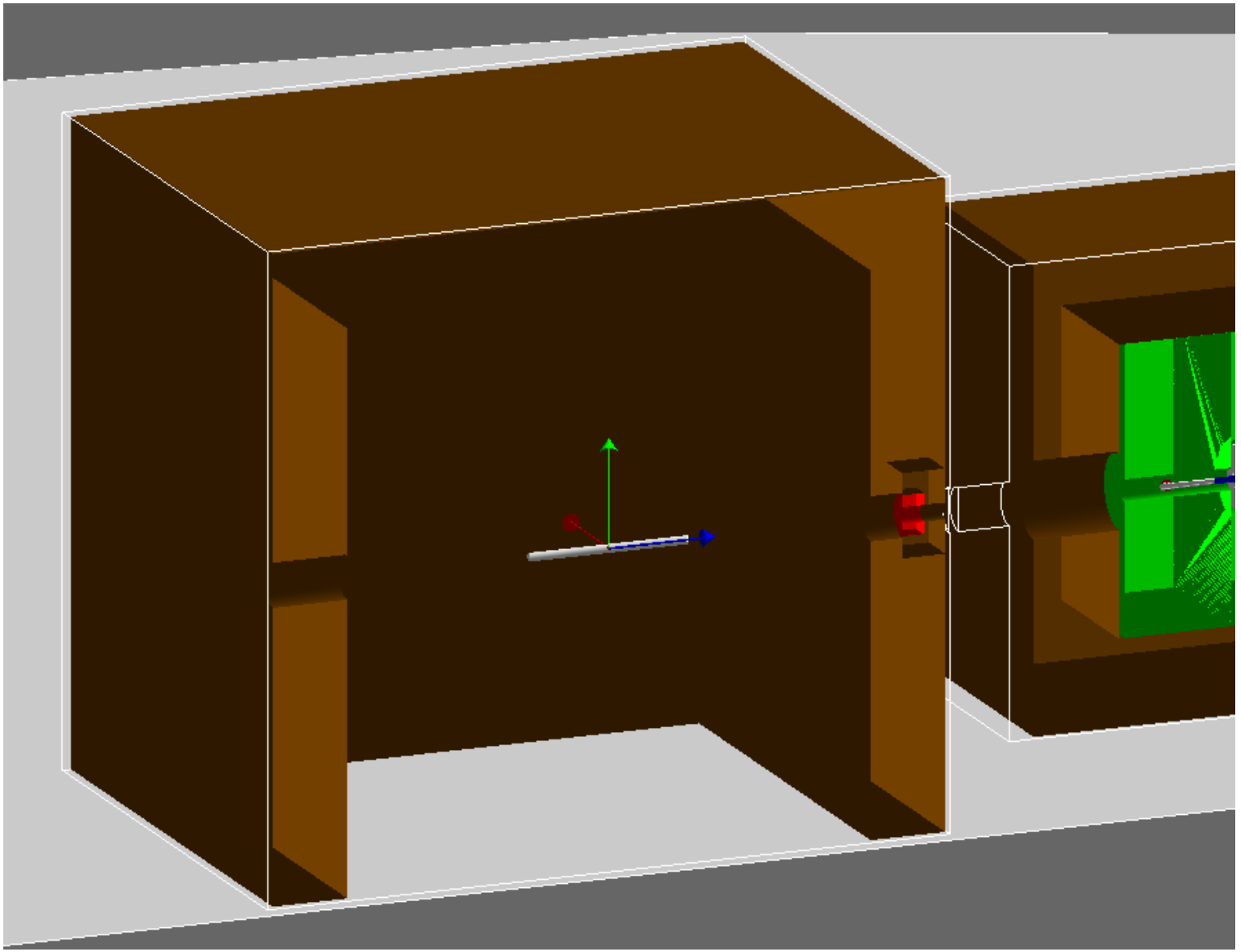
Percent Change of Flux wrt Initial Design					
		Ideal		Bare Min	
Type	E range	Hall	Sky	Hall	Sky
	(MeV)	(%)	(%)	(%)	(%)
abs(electrons)	E<10	-17.2	-6.6	23.8	29.2
abs(electrons)	E>10	0.9	2.1	27.0	-17.6
Photons	E<10	0.0	0.0	45.9	22.9
Photons	E>10	-0.1	-3.6	31.9	-11.2
Neutrons	E<10	-8.2	-1.1	28.4	40.0
Neutrons	E>10	39.5	12.1	90.8	46.6

More Geometry Views

Ideal Design



Ideal Design



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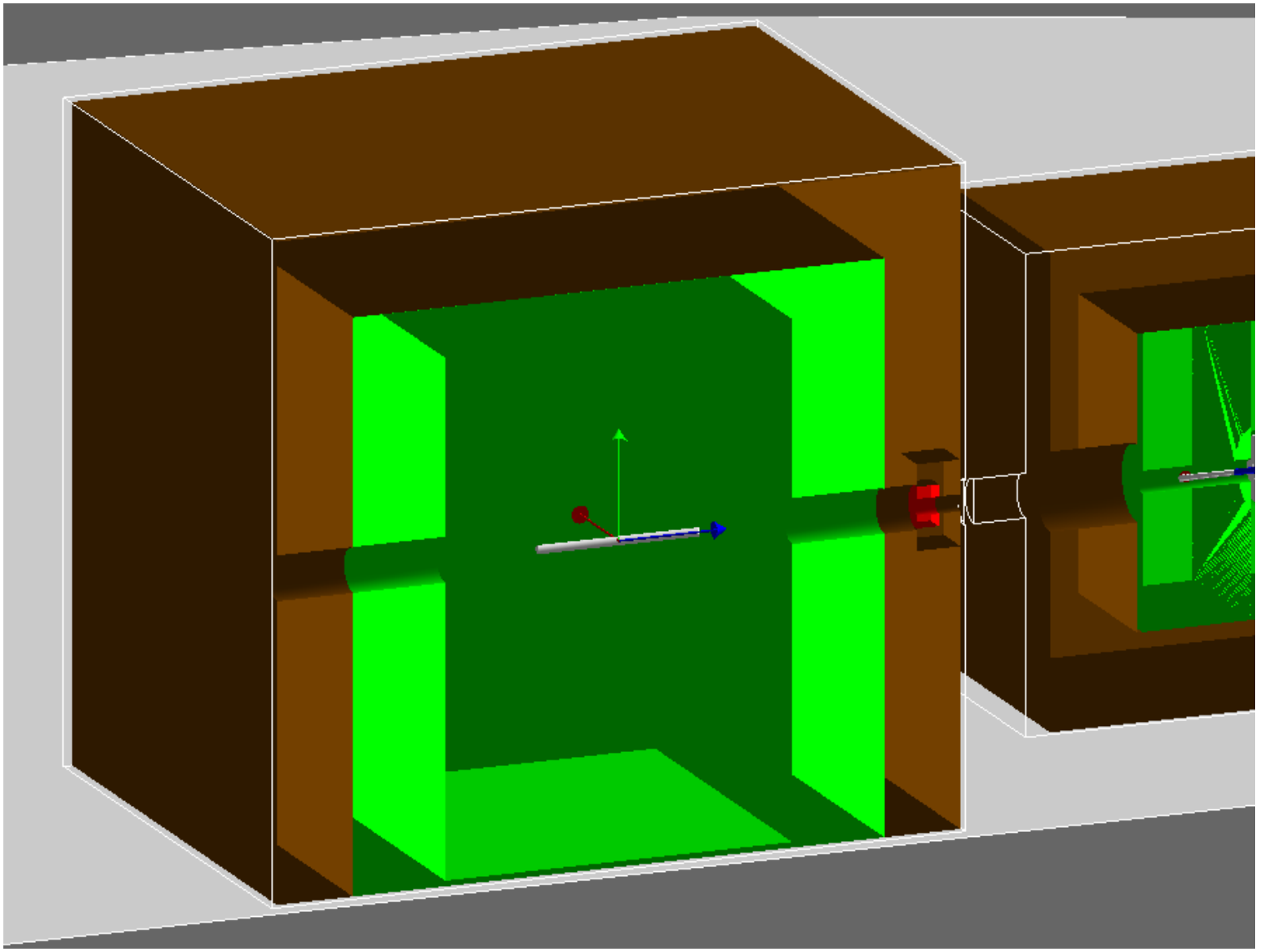
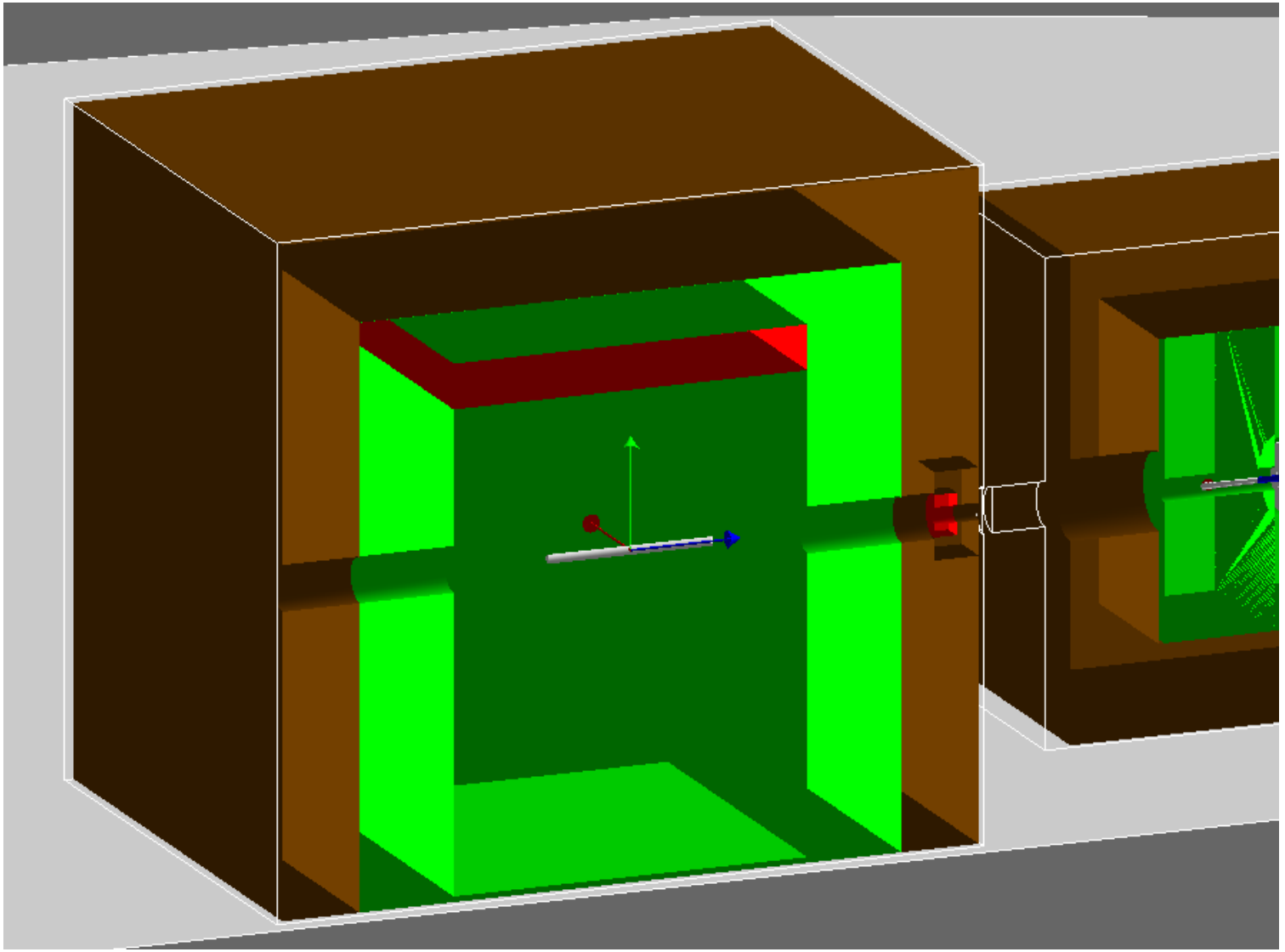
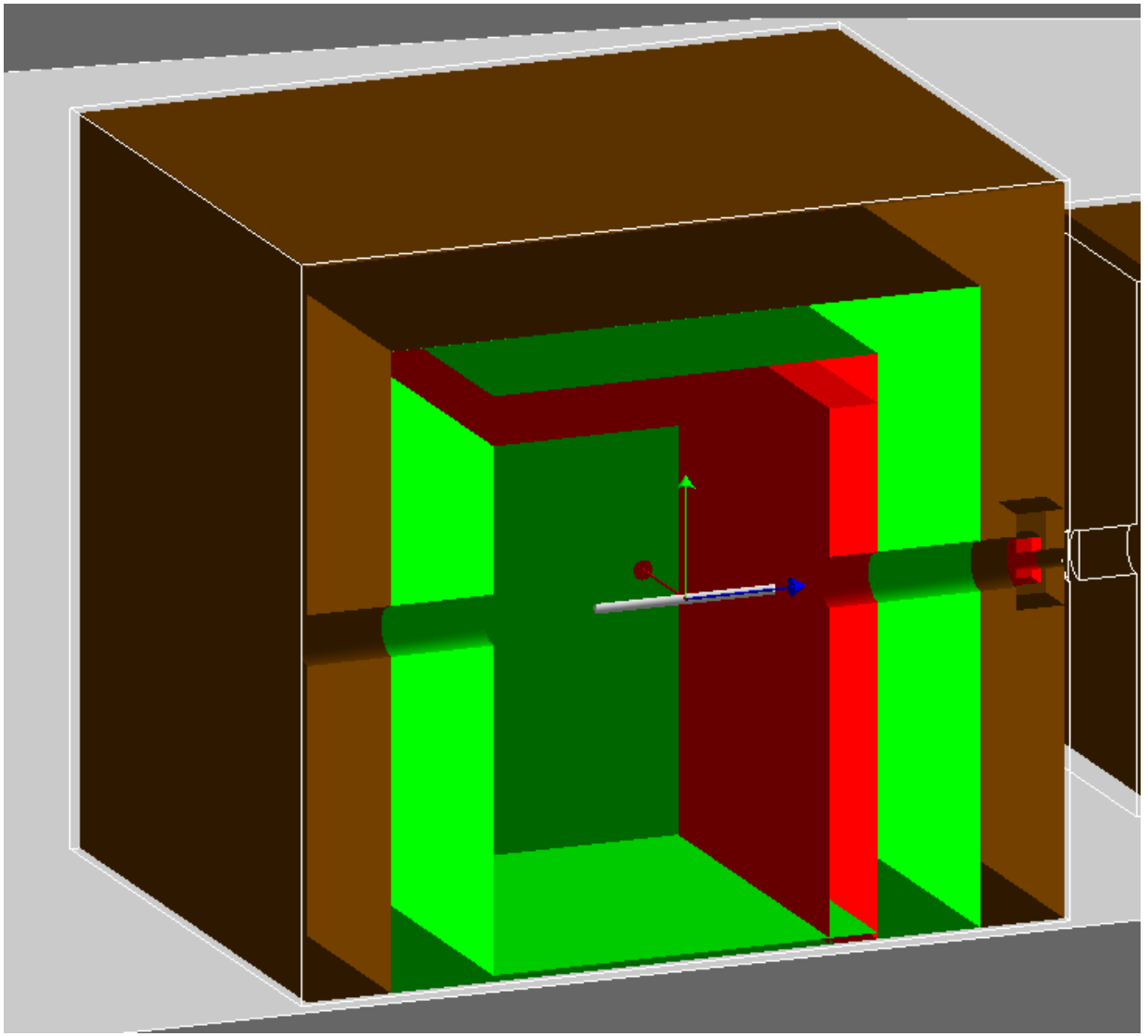


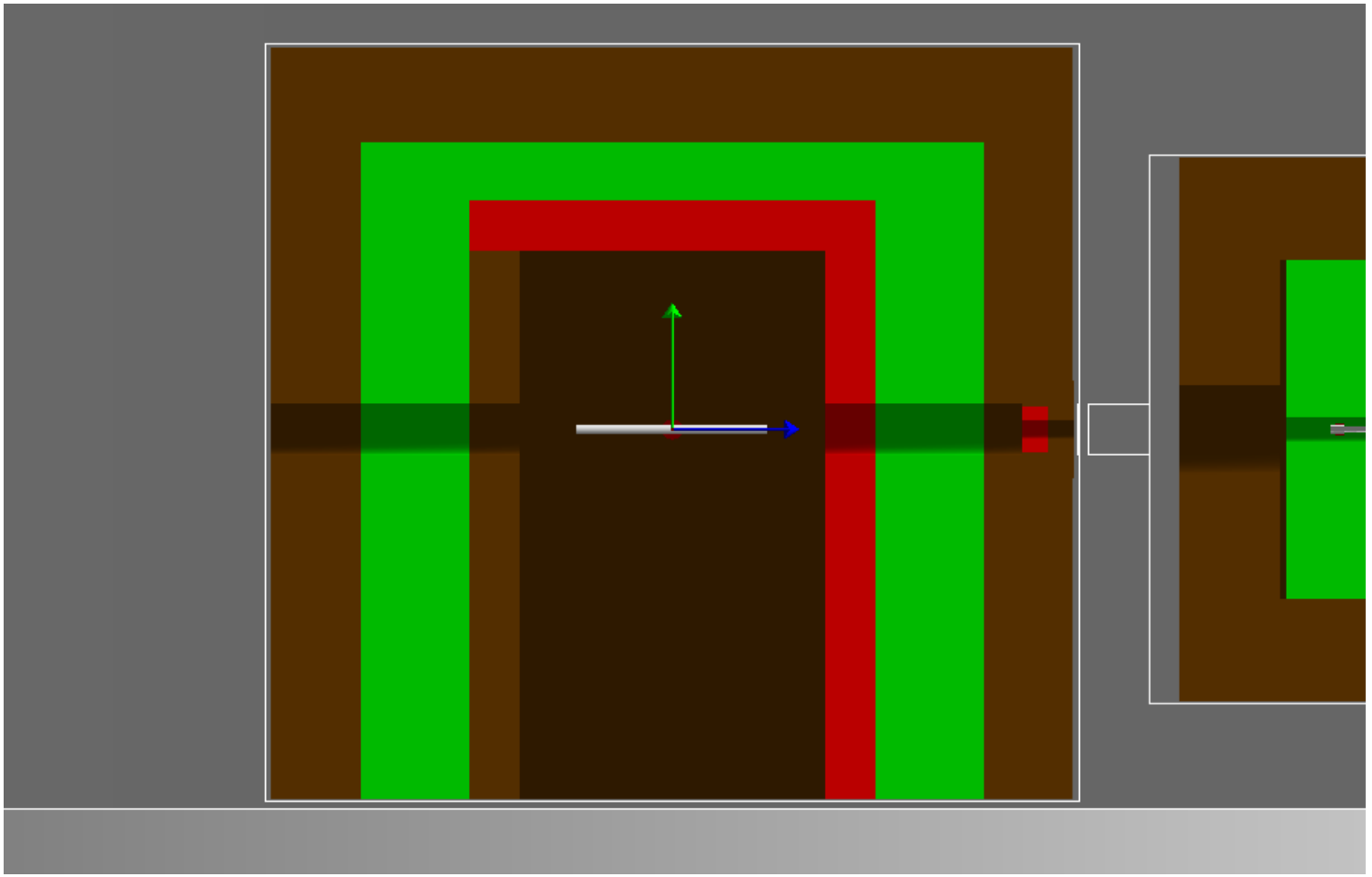
Ideal Design



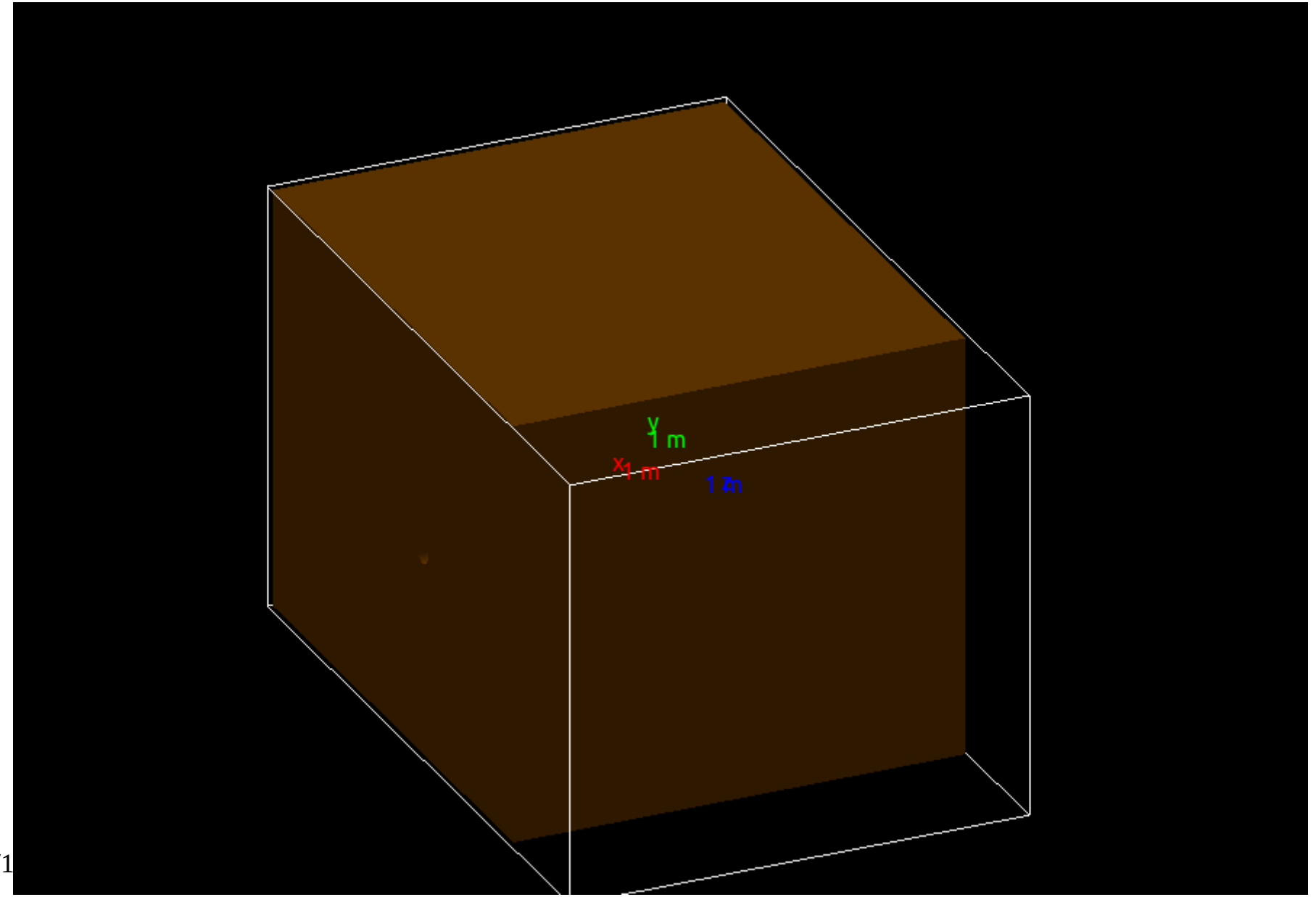
Ideal Design



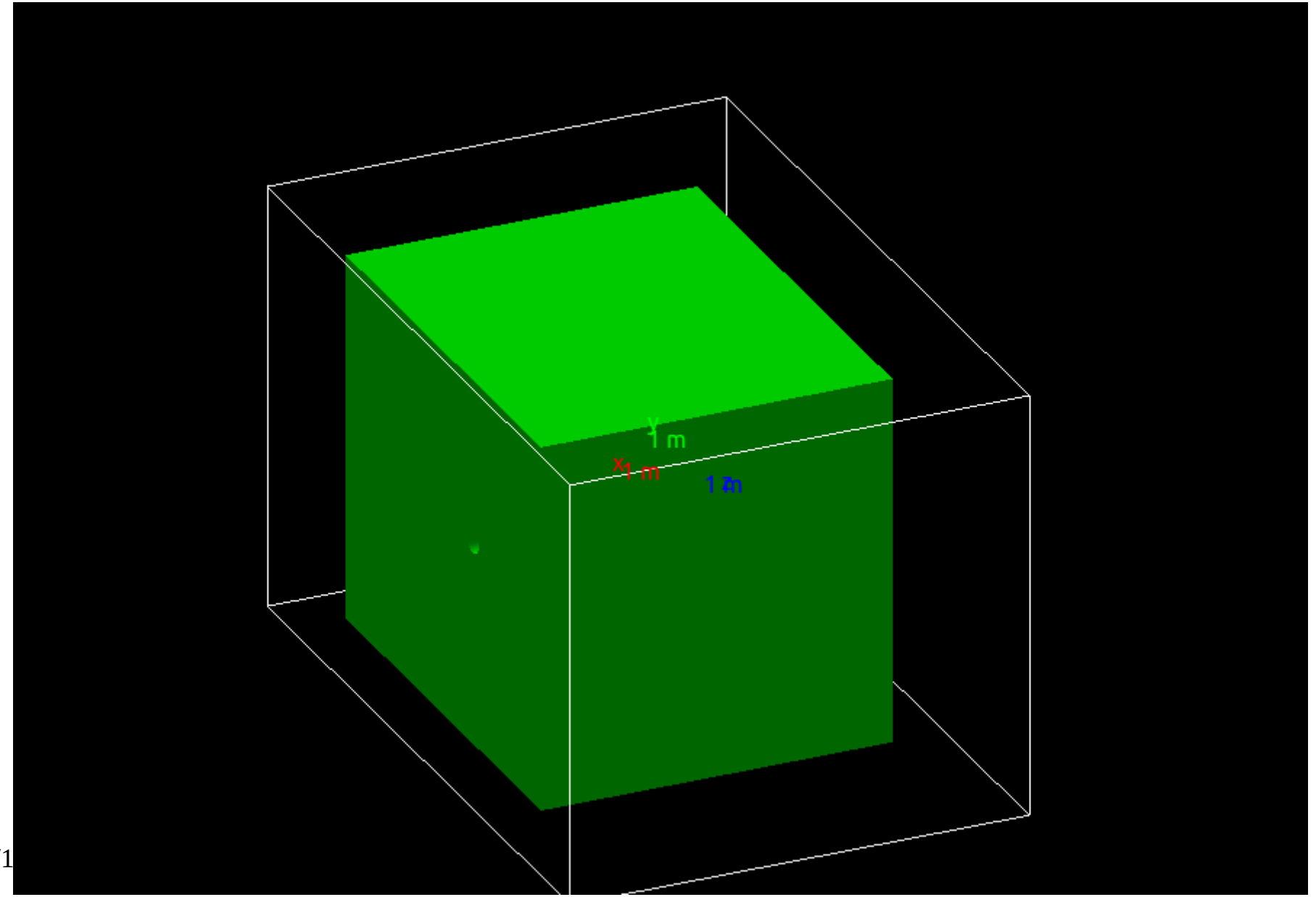
Ideal Design



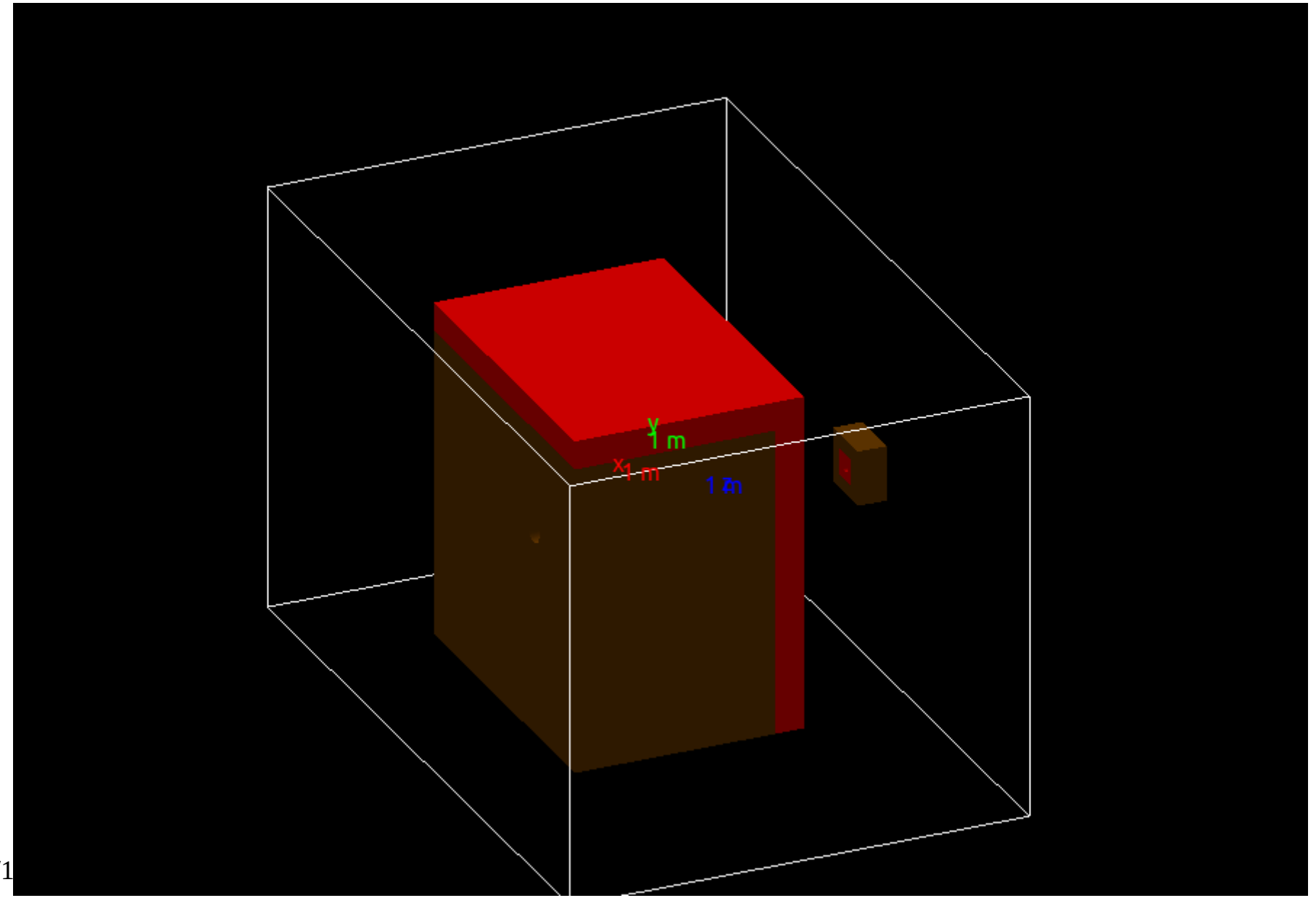
Ideal Design



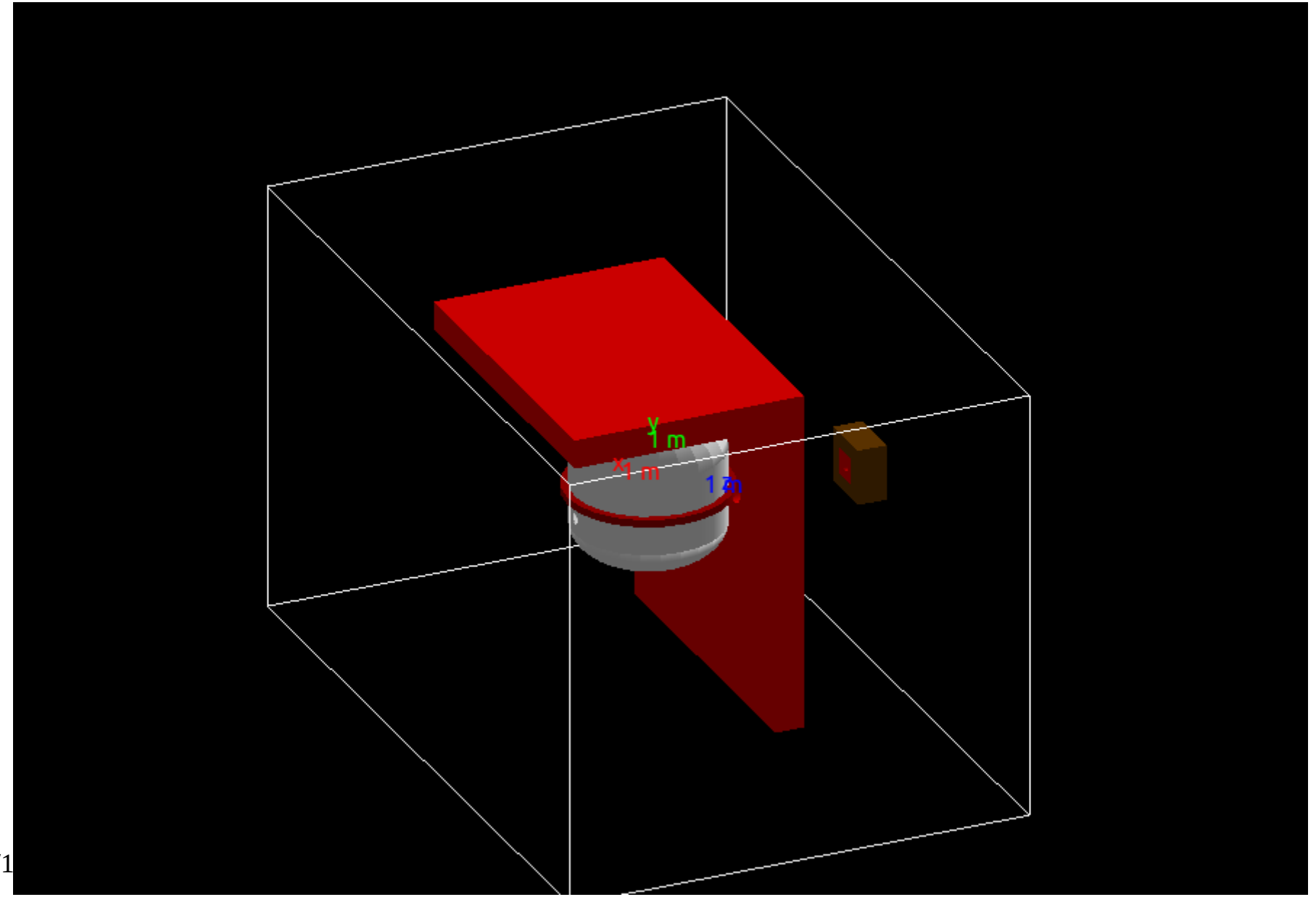
Ideal Design



Ideal Design



Ideal Design



Ideal Design