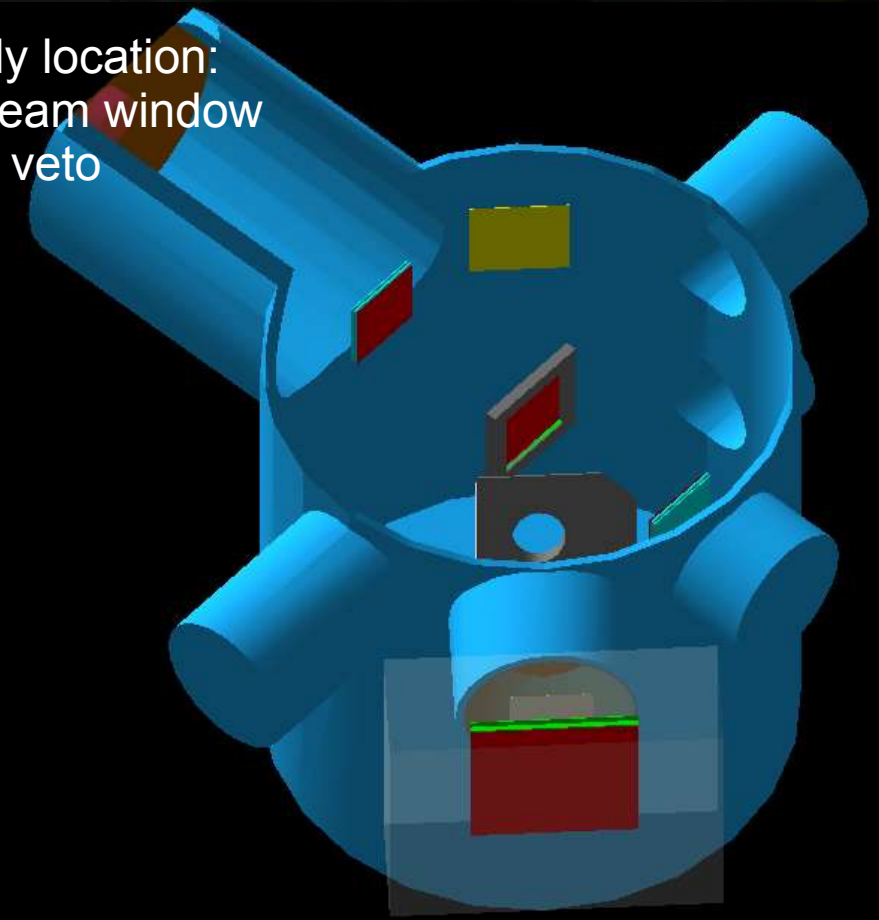
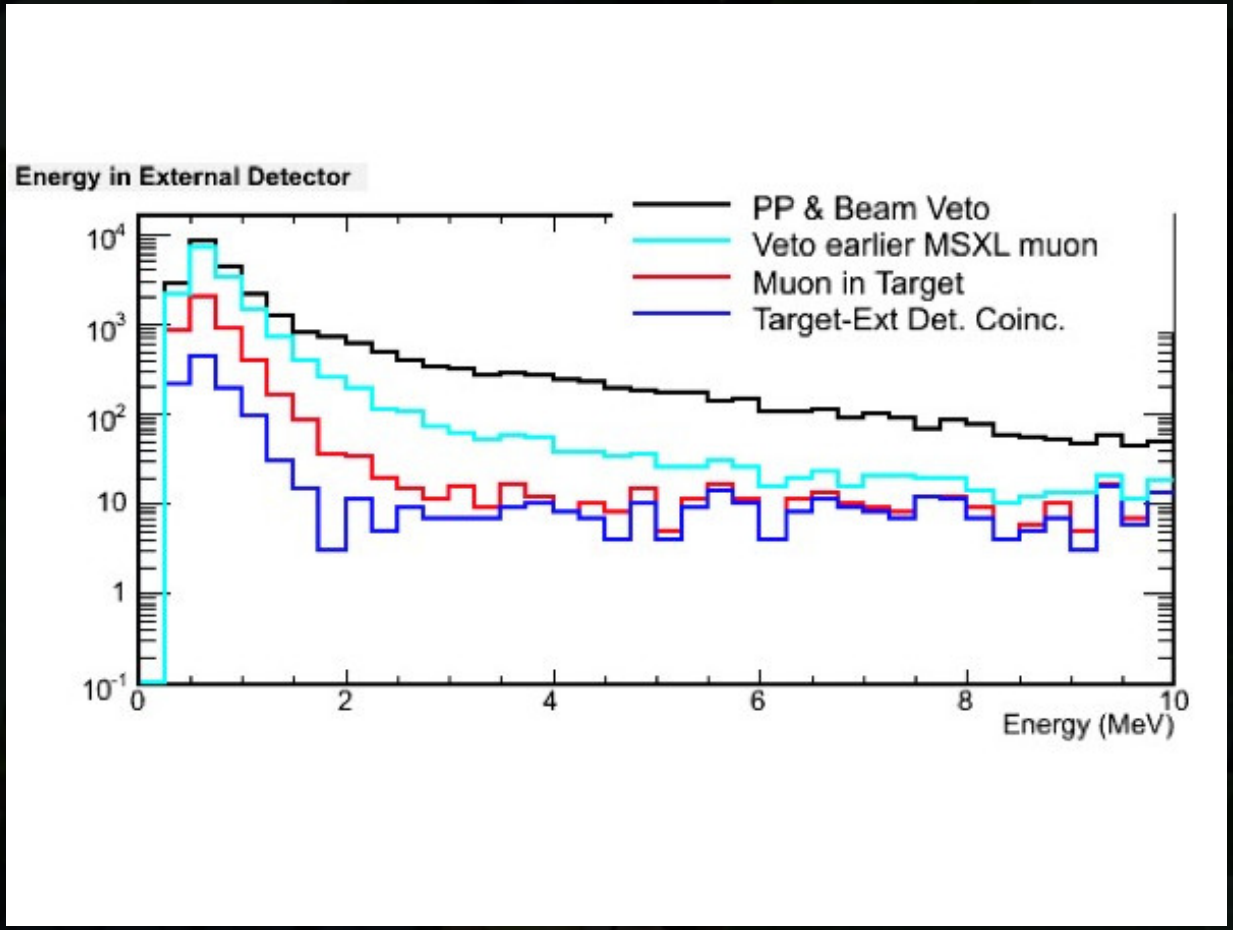
An Attempt to Reproduce the Old Energy Spectrum

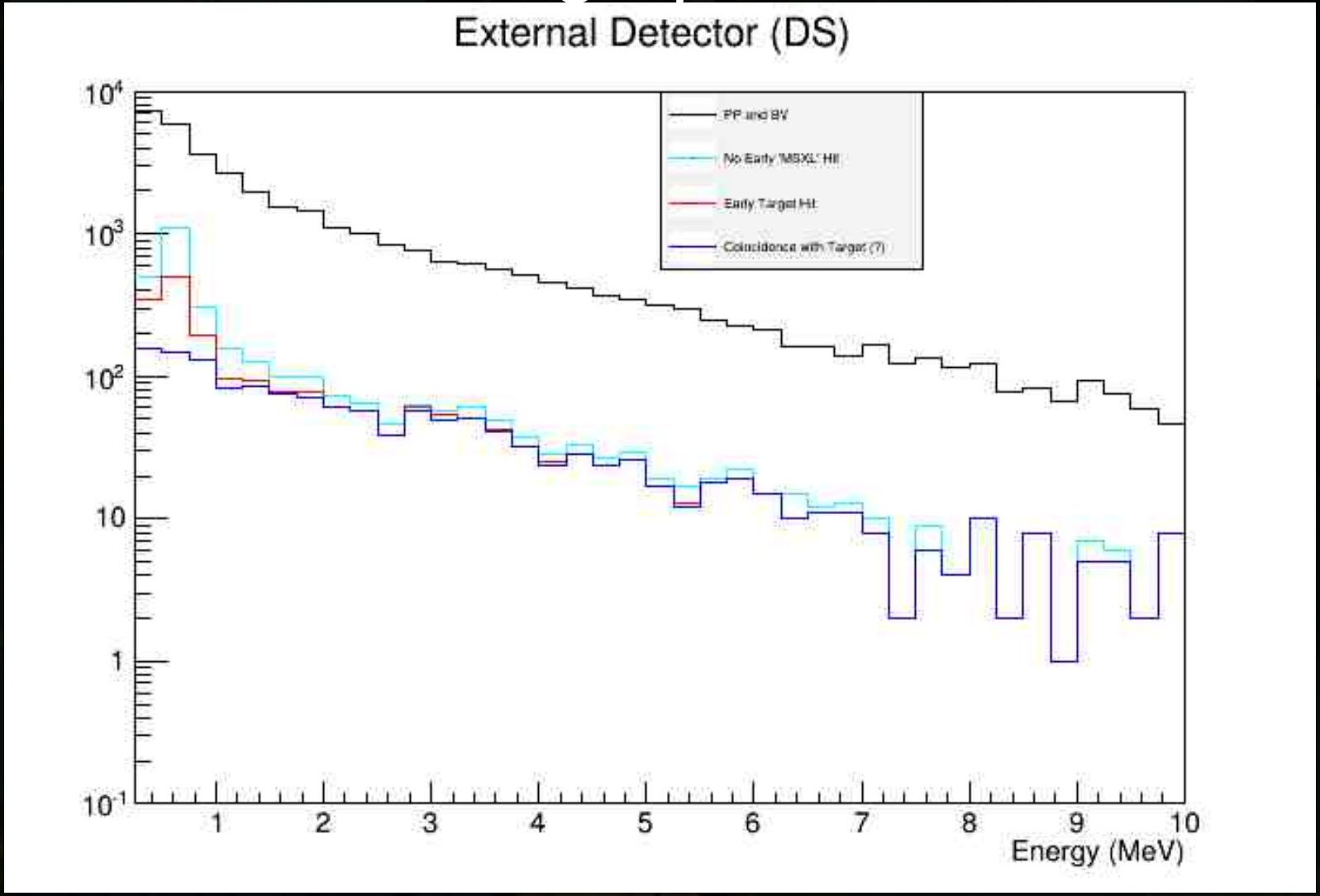
- Collimator in cruddy location: line of sight from beam window
- 6 cm x 6 cm beam veto
- 5 cm x 5 cm target



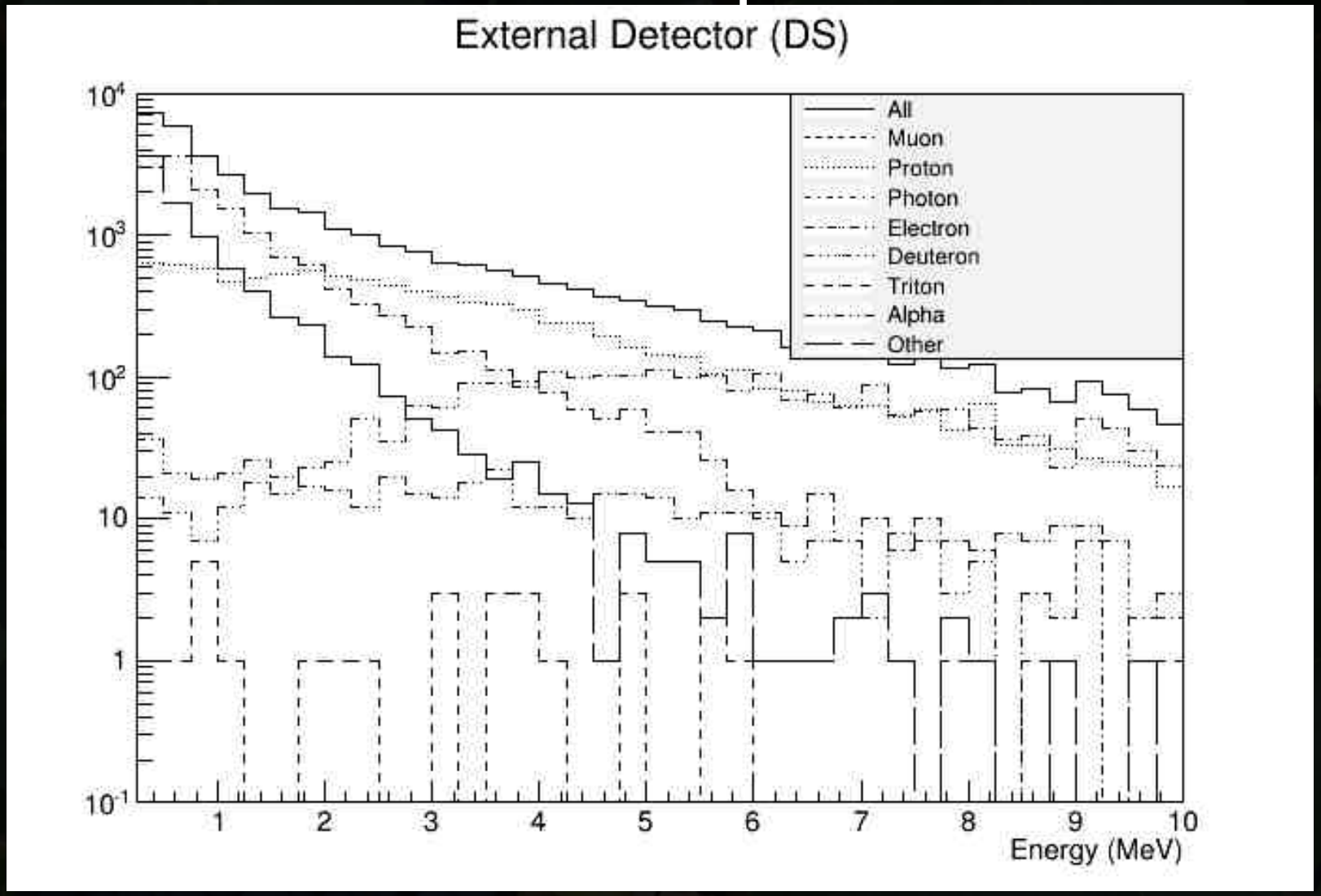
What are we trying to reproduce?



Our graphs....


External Detector (DS)
PP and BV
No Early MSXL Hit
Early Target Hit
Coincidence with Target (?)
10^4
10^3
10^2
10
1
10^{-1}
1
2
3
4
5
6
7
8
9
10
Energy (MeV)

Particle Composition



Particle Composition

E_{800ns}>250 keV

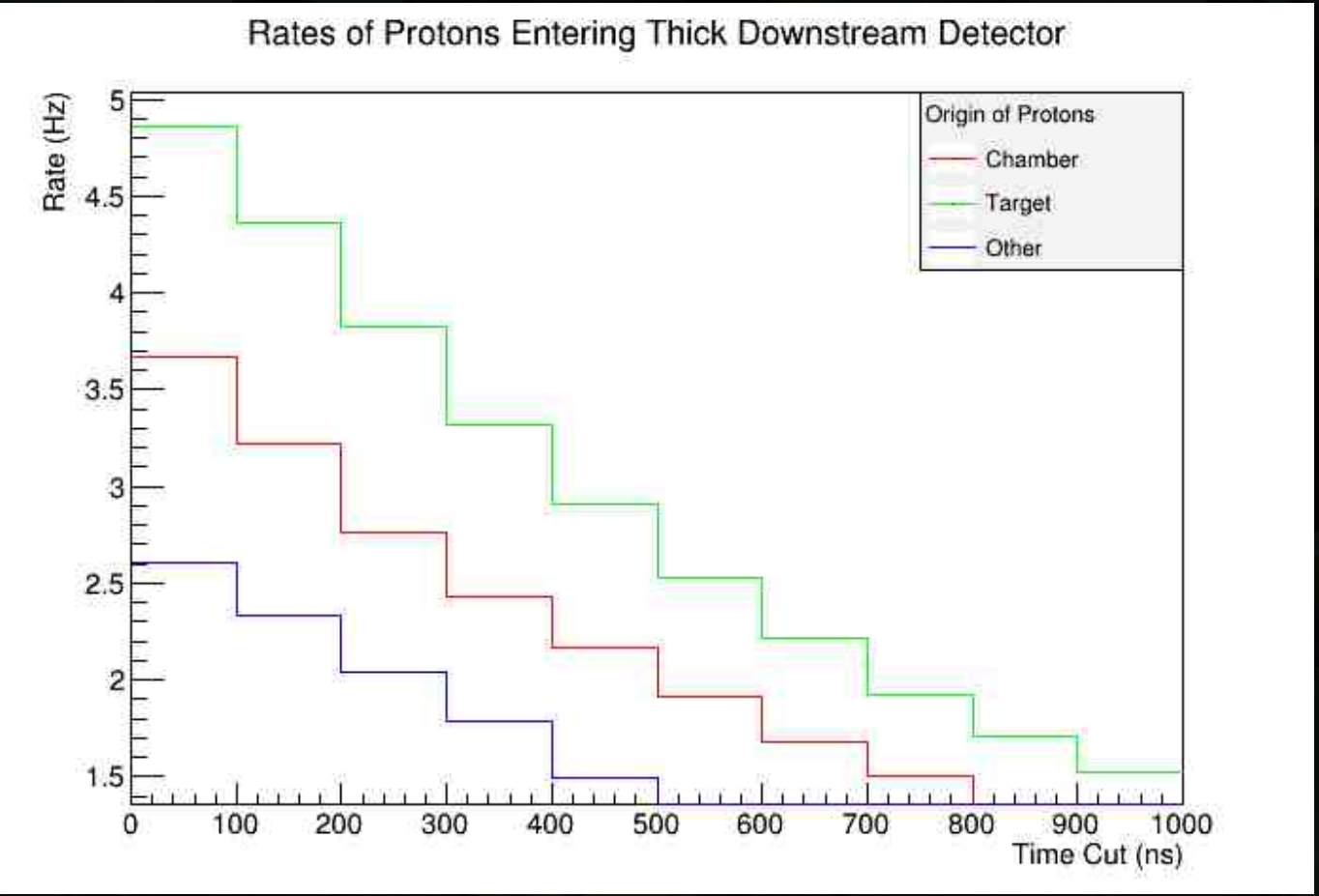
	Muons	Protons	Electrons	Photons	Deuterons	Tritons	Alphas	Other
PP/BV	0.0%	26.1%	42.3%	0.0%	1.4%	0.1%	6.4%	23.8%
NoSi	0.0%	20.8%	72.9%	0.0%	1.3%	0.2%	3.9%	0.9%
MuStp	0.0%	30.3%	61.7%	0.0%	1.5%	0.2%	5.3%	1.0%

E_{800ns}>2 MeV

	Muons	Protons	Electrons	Photons	Deuterons	Tritons	Alphas	Other
PP/BV	0.0%	49.9%	20.9%	0.0%	3.1%	0.2%	20.5%	5.4%
NoSi	0.0%	63.3%	17.8%	0.0%	4.3%	0.6%	13.0%	1.0%
MuStp	0.0%	67.8%	13.5%	0.0%	3.7%	0.7%	13.2%	1.0%

No cuts in these rates plots other than time

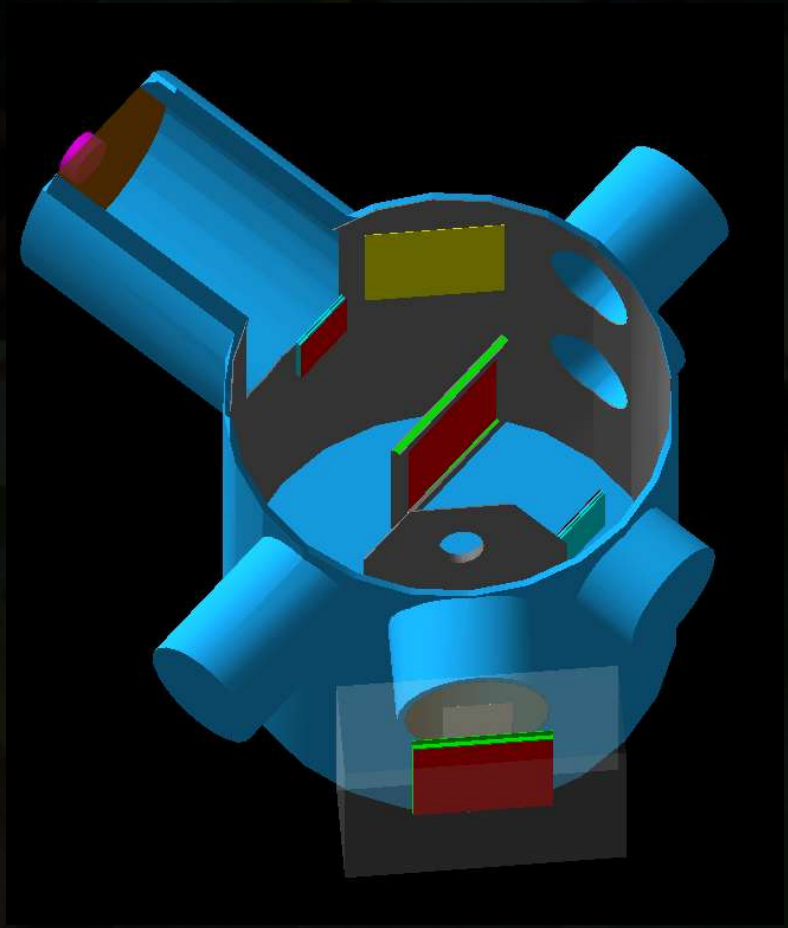
Rates



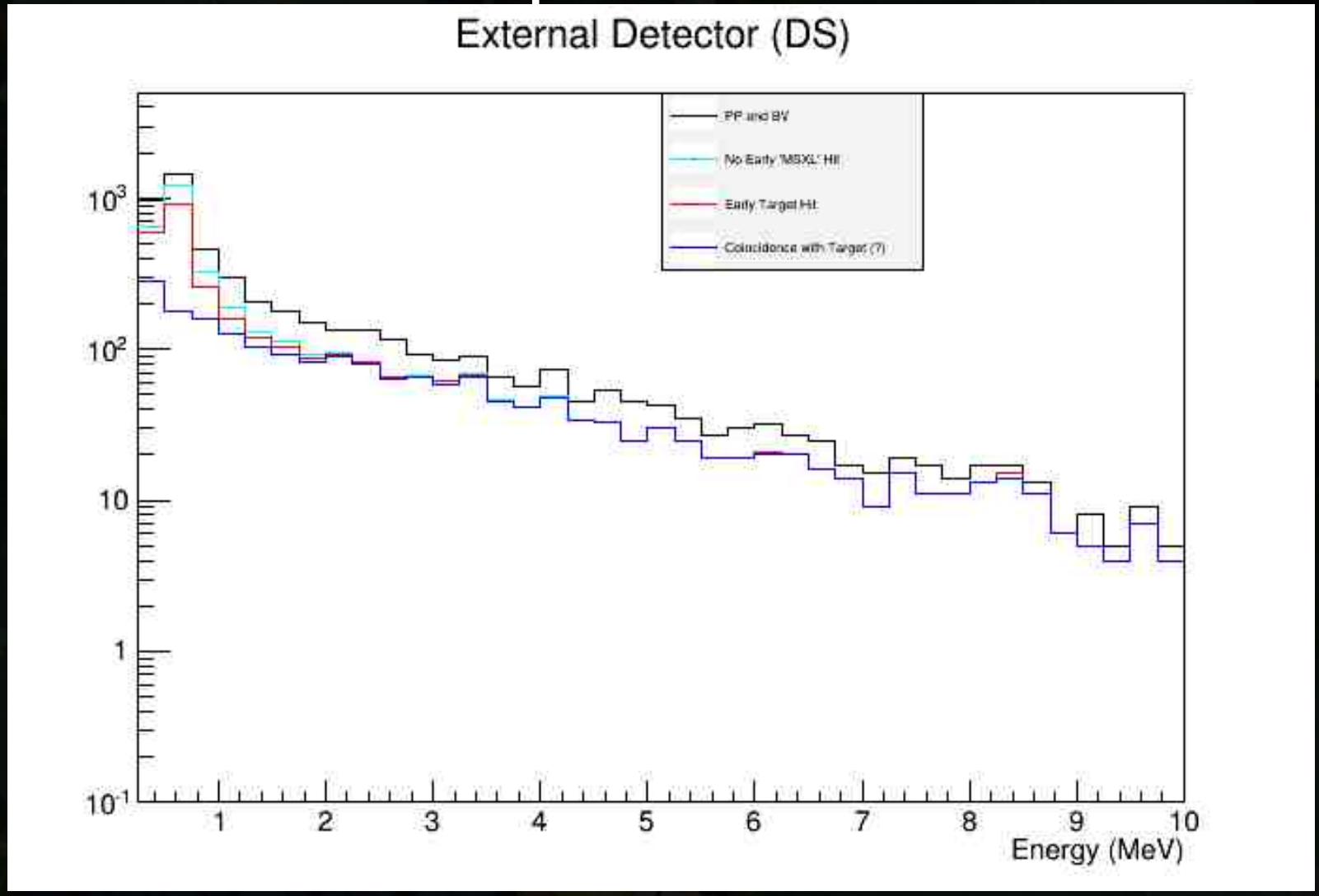
Possible Current Setup

- 10 cm veto
- 10 cm target
- More shielding upstream
- Lead lining downstream (180 degree coverage plus half the roof)

First we'll look at a chamber without the lining



Spectrum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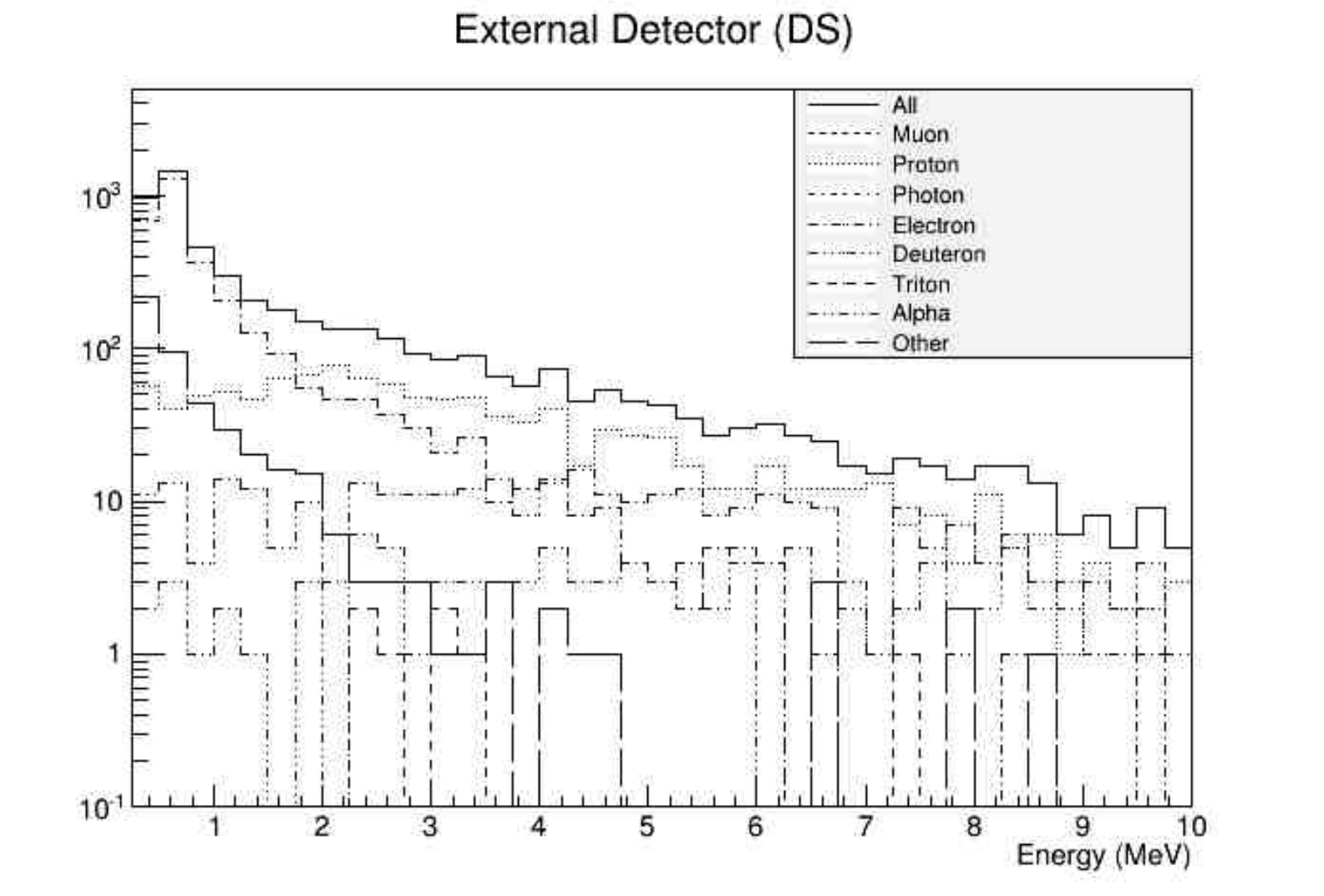
10^{-1}
1
2
3
4
5
6
7
8
9
10
Energy (MeV)

Particle Composition



Particle Composition

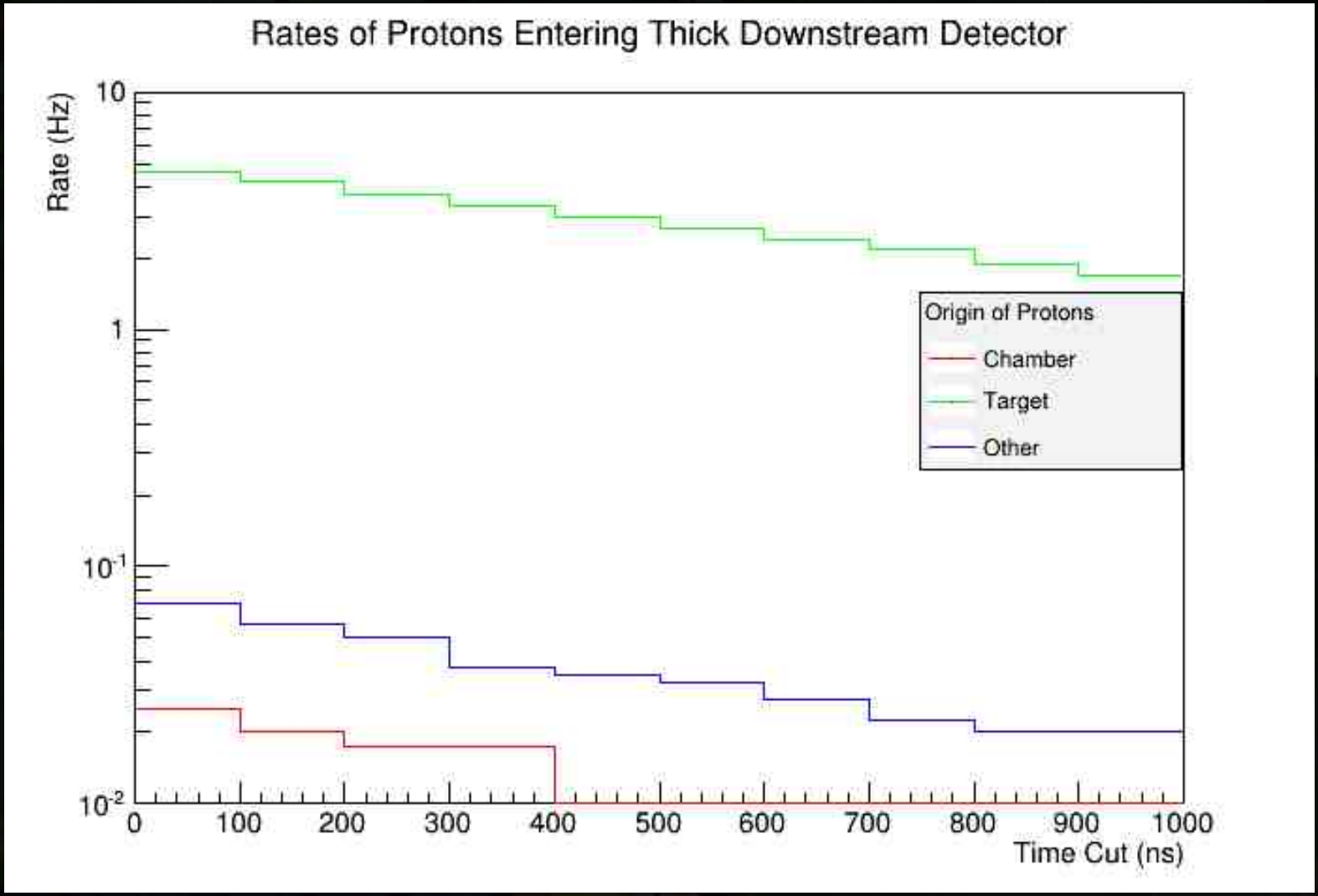
E_{800ns}>250 keV

	Muons	Protons	Electrons	Photons	Deuterons	Tritons	Alphas	Other
PP/BV	0.0%	18.8%	73.7%	0.0%	1.9%	0.2%	4.4%	1.0%
NoSi	0.0%	18.8%	73.8%	0.0%	0.2%	1.9%	4.4%	0.9%
MuStp	0.0%	23.0%	68.6%	0.0%	2.3%	0.2%	5.3%	0.5%

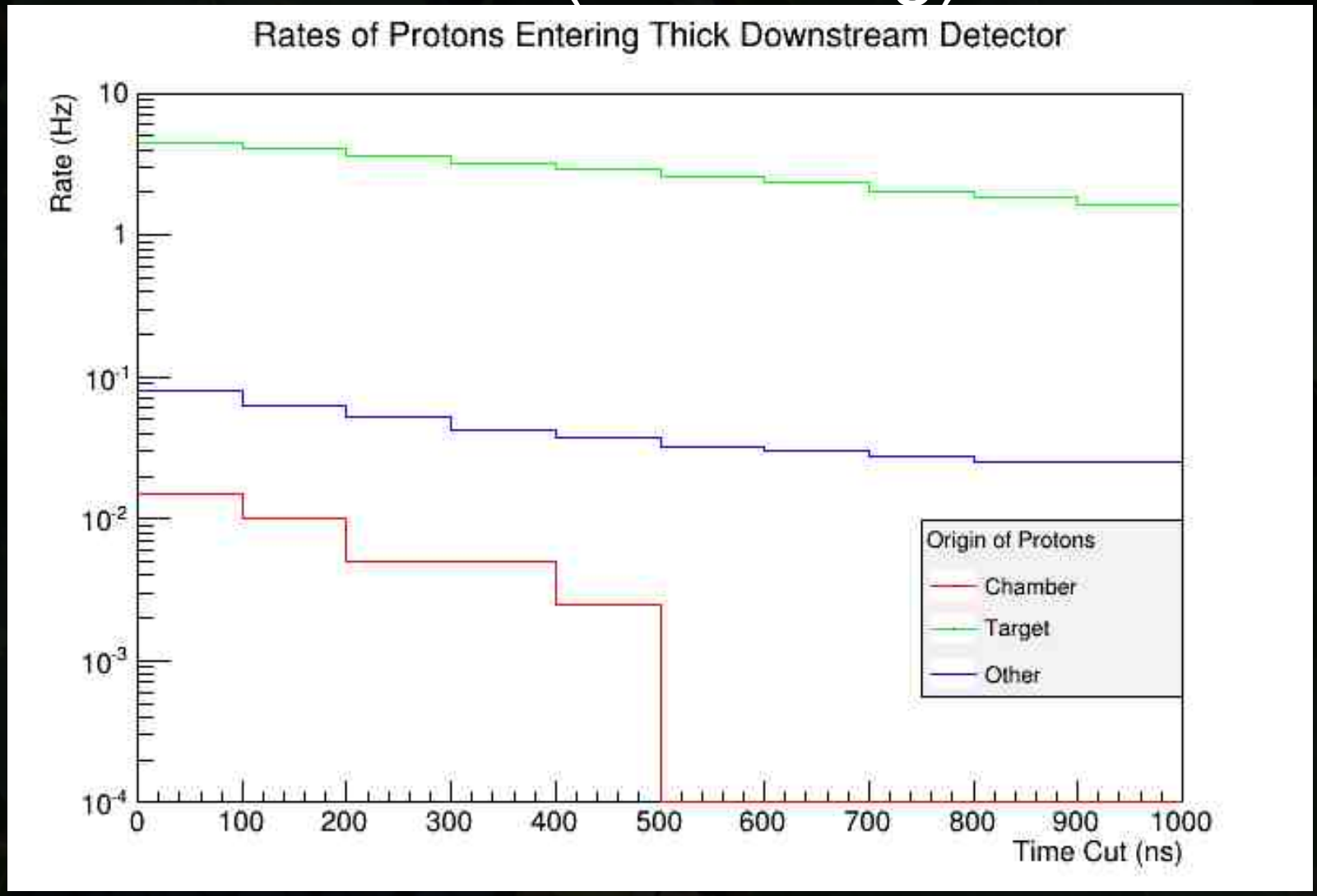
E_{800ns}>2 MeV

	Muons	Protons	Electrons	Photons	Deuterons	Tritons	Alphas	Other
PP/BV	0.0%	45.9%	36.1%	0.0%	5.7%	0.5%	11.6%	0.2%
NoSi	0.0%	45.9%	36.2%	0.0%	0.5%	5.7%	11.6%	0.2%
MuStp	0.0%	58.3%	19.0%	0.0%	7.2%	0.6%	14.7%	0.1%

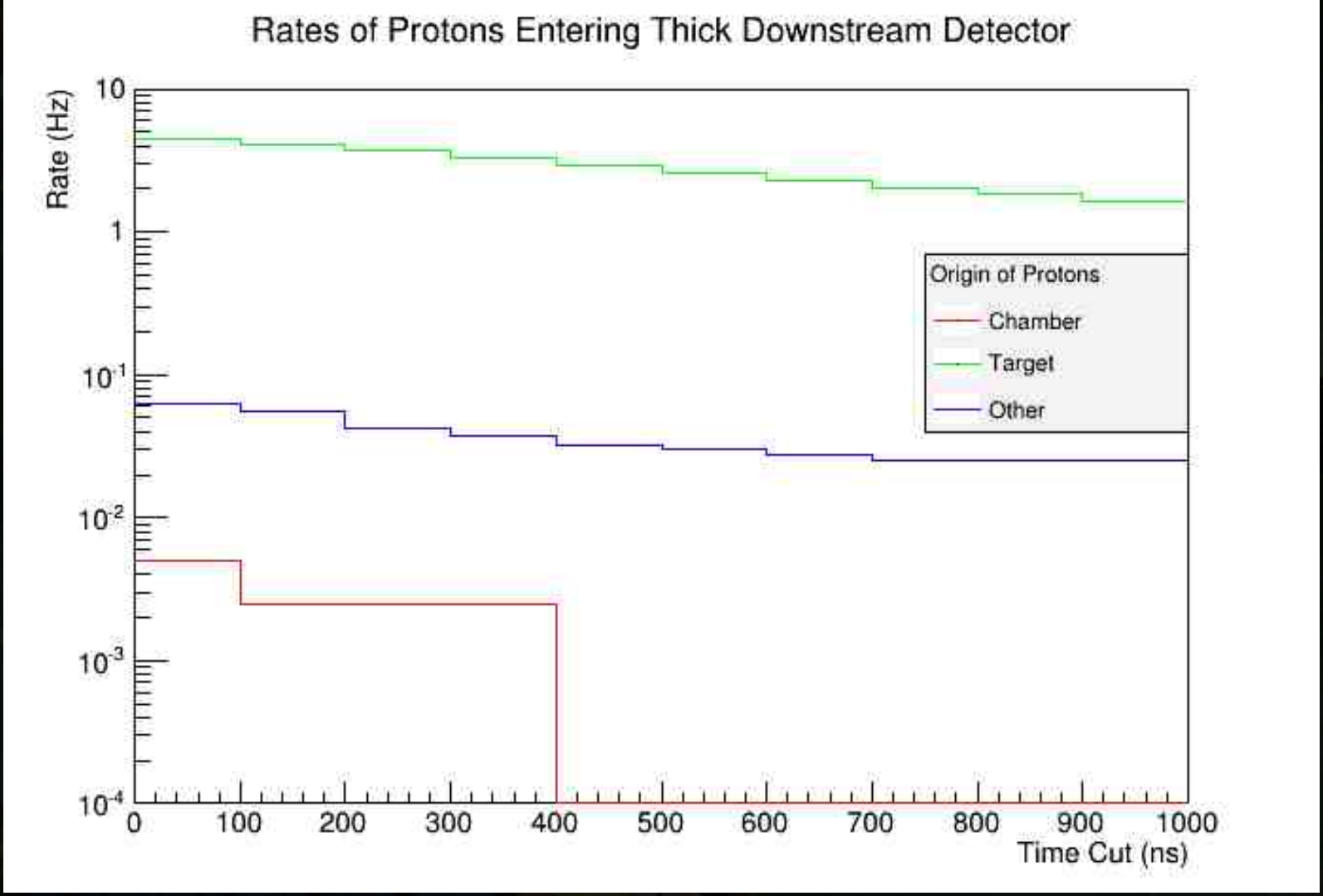
Rates (again, without the lining)



Rates (with lining)



Rates (90 Degree setup)



Conclusions thus far

- Further shielding upstream a necessity, though this is not news to anyone
- Lead lining downstream may not be necessary even with thin target
- 90 degree setup seems a bit better for the proton rates, still have to check particle spectrum