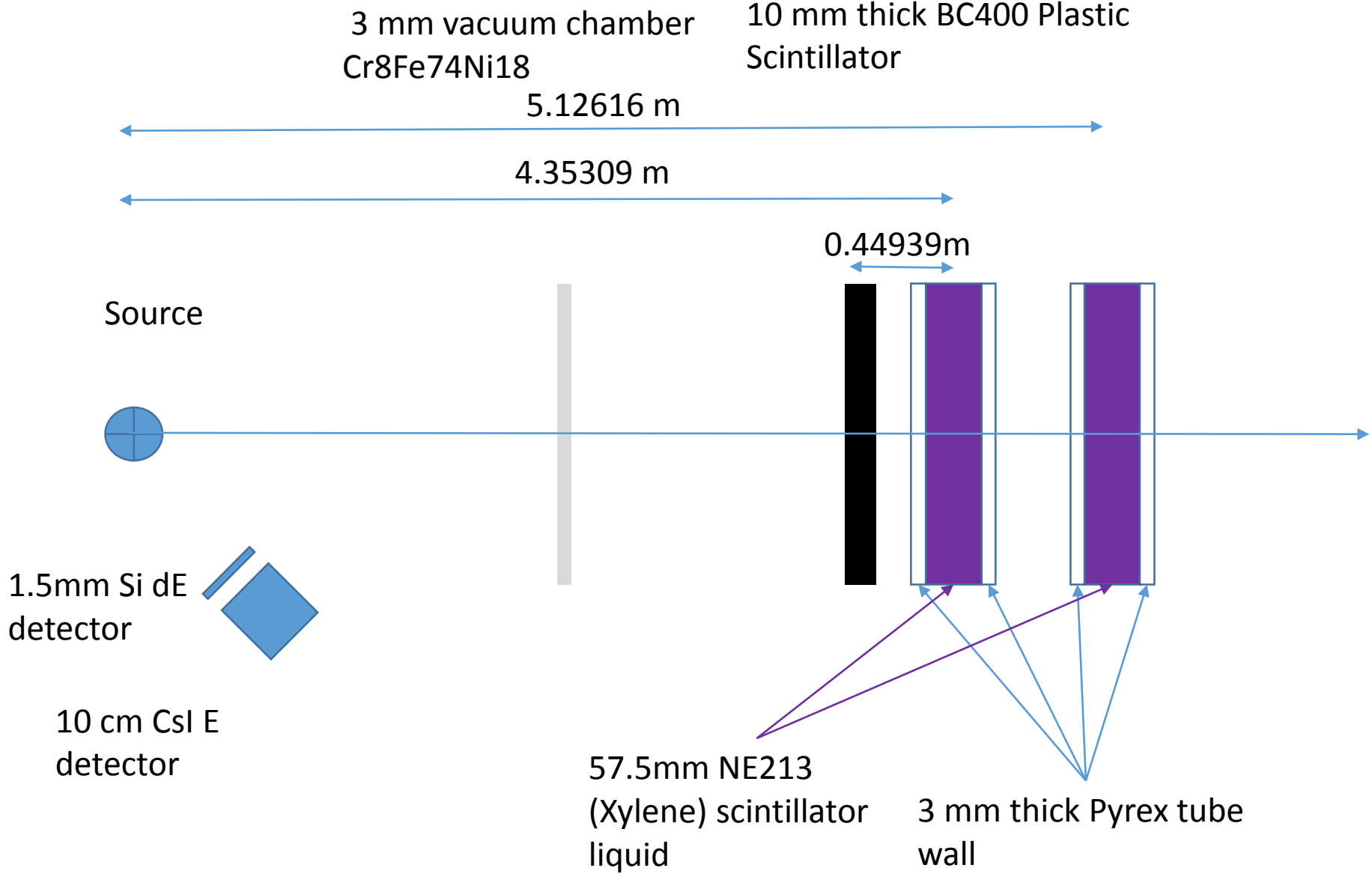


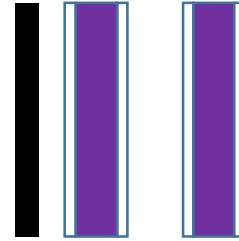
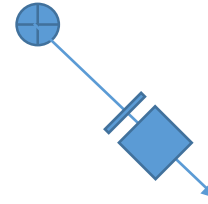
Simplified Geometry of the setup



Model used

- ATIMA 1.2 LS-theory in LISE++

Punch through for HiRA

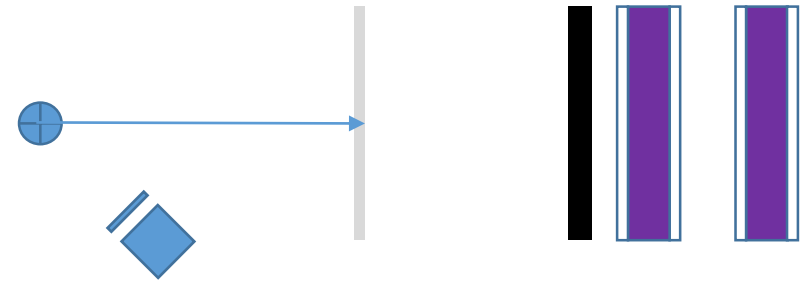


Particle	1.5 mm E Si (MeV)	10 cm CsI (MeV)	Loss in Si (MeV)
p	15.4273	198.485	1.267
d	20.7532	263.65	1.6654
t	24.63	312.444	1.9679
3He	54.5826	709.3068	4.5534
4He	62.01368	797.84	5.06
6He	77.4	939.444	5.925
8He	83.28	1057.128	6.6558

Punch through for NW

- Punch through for vacuum chamber

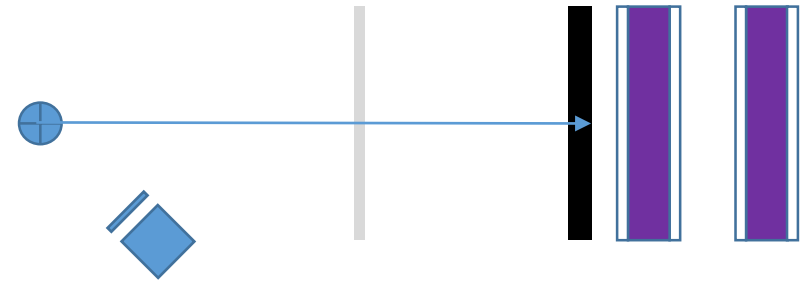
Particle	Vacuum chamber (assuming 3mm steel Cr8Fe74Ni18)
p	41.09
d	55.8
t	66.3
3He	146.15
4He	165.19
6He	197.04
8He	223.16



Punch through for NW

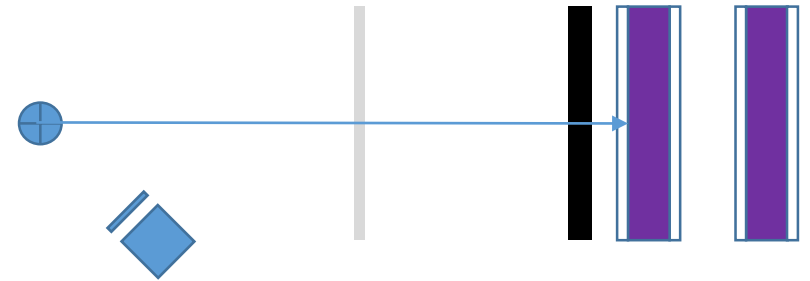
- Punch through for Veto wall

Particle	10 mm BC400 Plastic Bar	Loss in Vacuum Chamber
p	54.88	22.455
d	74.56252	30.171
t	89.3712	35.908
3He	193.80645	79.515
4He	220.472	89.631
6He	263.25	106.61
8He	298.8888	120.65



Punch through for NW

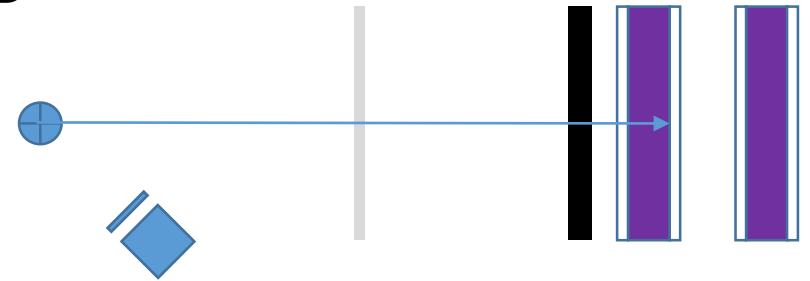
- Punch through for Pyrex tube in NW B



Particle	3 mm Pyrex tube	Loss in 10 mm BC400 Plastic Bar	Loss in Vaccum Chamber
p	61	18.271	19.93
d	82.744	24.99	26.76
t	99.12	30.12	31.84
3He	215.4	64.242	70.61
4He	245	72.889	79.56
6He	292.38	87.54	94.62
8He	331.68	99.807	107.1

Punch through for NW

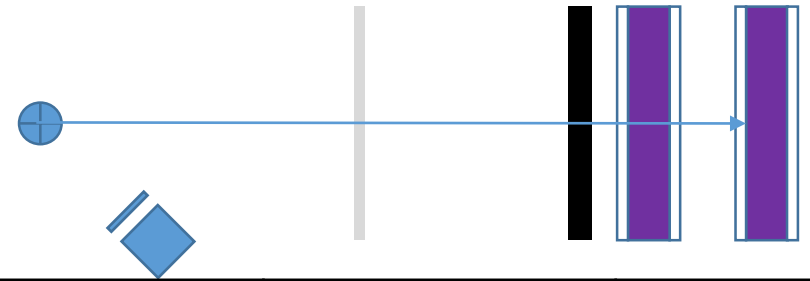
- Punch through for Scintillator liquid in NW B



Particle	57.5 mm NE213 Scintillator NWB	Loss in 3 mm Pyrex tube NWB	Loss in 10 mm BC400 Plastic Bar	Loss in Vacuum Chamber
p	61	4.8066	8.2952	12.35
d	140.084	6.4559	11.186	16.41
t	167.85	7.691	13.355	19.41
3He	365.16	17.042	29.378	44.03
4He	414.8	19.182	33.1	49.31
6He	494.76	22.794	39.44	58.25
8He	561.376	25.808	44.705	65.63

Punch through for NW

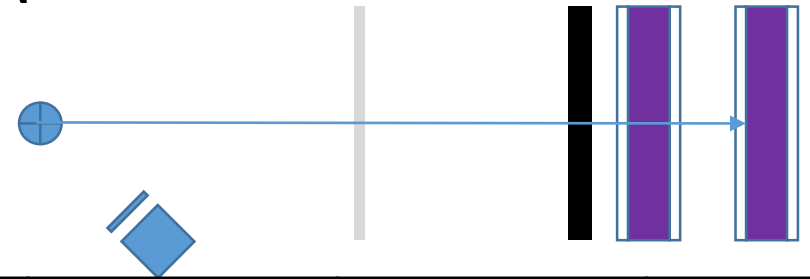
- Punch through for Pyrex tube in NW A



Particle	3 mm Pyrex tube NW A	Loss in 3 mm Pyrex tube NWB	Loss in 57.5 mm NE213 Scintillator NWB	Loss in 3 mm Pyrex tube NWB	Loss in 10 mm BC400 Plastic Bar	Loss in Vacuum Chamber
p	110.834	10.86	53.719	44.39	7.7305	11.677
d	150.18	14.861	72.926	5.958	10.404	115.496
t	179.82	17.879	87.345	7.092	12.429	18.377
³ He	392.115	38.213	189.45	15.76	27.401	41.638
⁴ He	445.24	43.316	214.28	17.71	30.84	46.613
⁶ He	530.7	52.043	256.37	21.05	36.687	55.024
⁸ He	601.856	59.36	291.39	23.82	44.158	61.962

Punch through for NW

- Punch through for Scintillator liquid in NW A



Particle	Loss in 57.5 mm NE213 Scintillator NW A	Loss in 3 mm Pyrex tube NW A	Loss in 3 mm Pyrex tube NW B	Loss in 57.5 mm NE213 Scintillator NW B	Loss in 3 mm Pyrex tube NW B	Loss in 10 mm BC400 Plastic Bar	Loss in Vacuum Chamber
p	141.41	4.8066	4.6062	35.04	3.4978	6.204	9.716
d	191.1	6.4559	6.1826	47.04	4.6484	8.281	12.81
t	228.66	7.6911	7.3617	56.09	5.526	9.8384	15.11
3He	501.18	17.042	16.341	124.4	12.476	22.093	34.79
4He	568.08	19.181	18.382	139.8	13.961	24.757	38.79
6He	675.84	22.794	21.835	166.1	16.484	29.294	45.58
8He	765.816	25.808	24.71	188	18.584	33.095	51.21