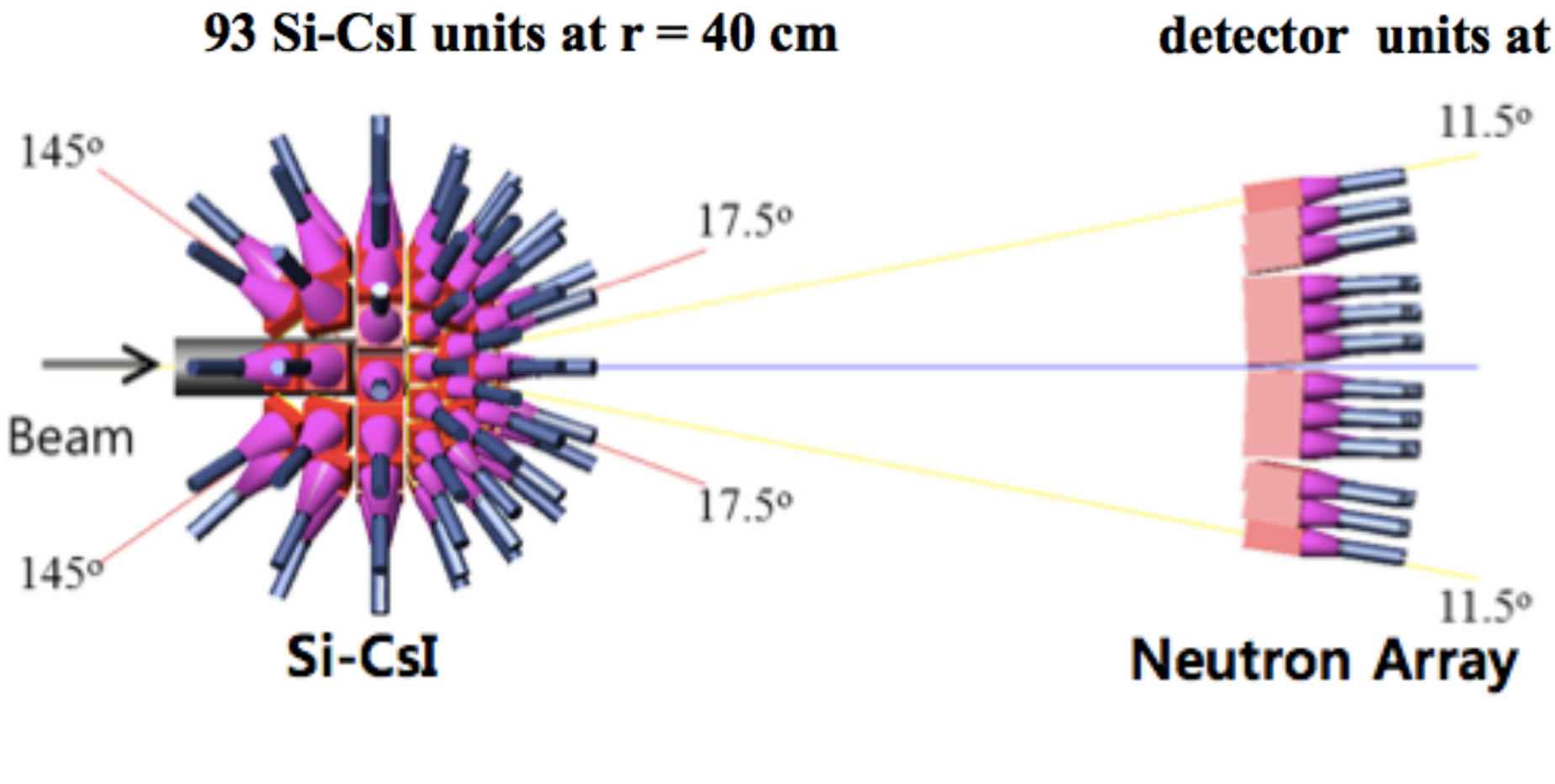
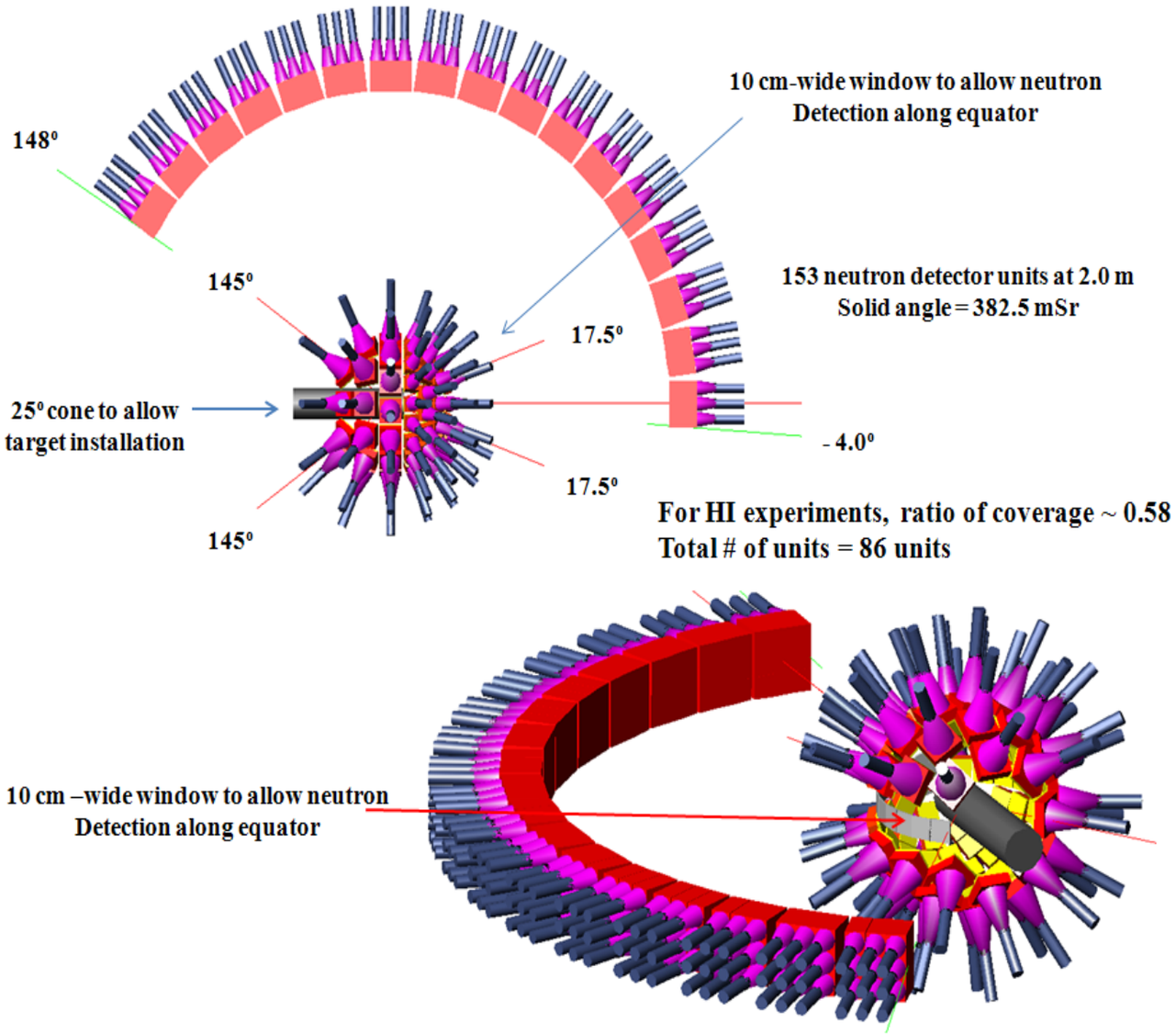
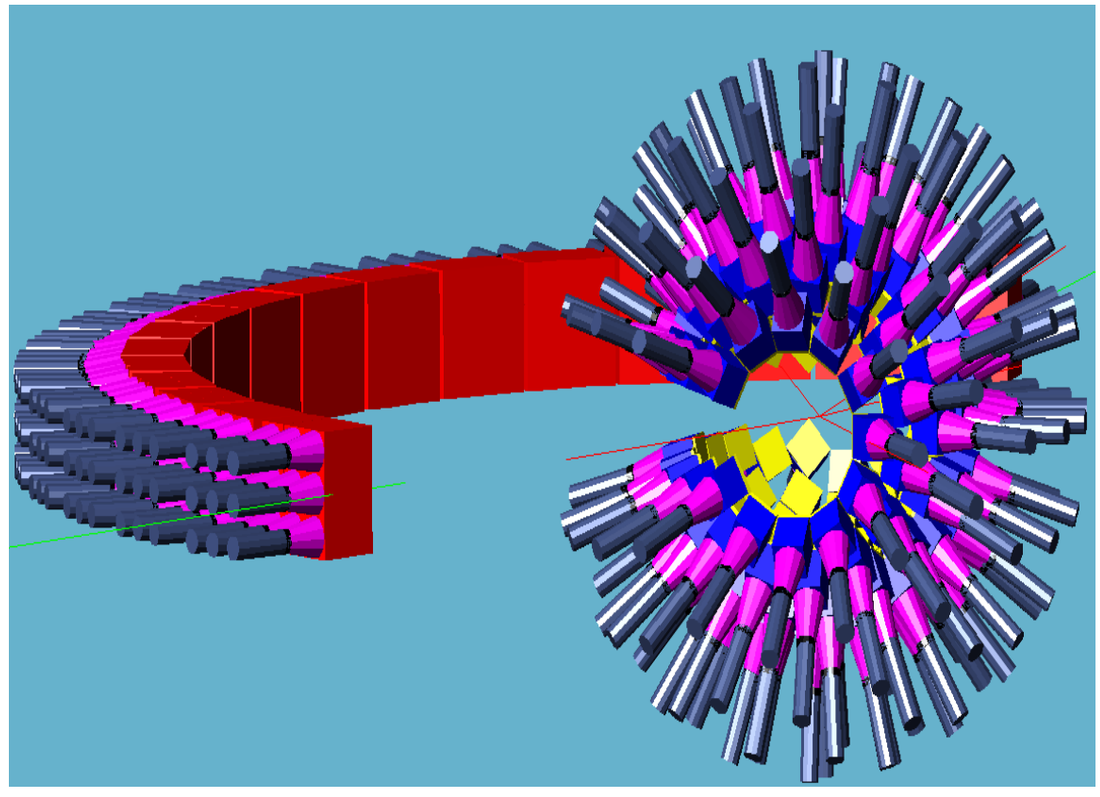
Large Acceptance Multi-Purpose Spectrometer (LAMPS) - low energy



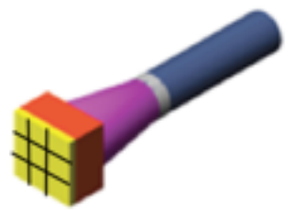
Large Acceptance Multi-Purpose Spectrometer (LAMPS) - low energy



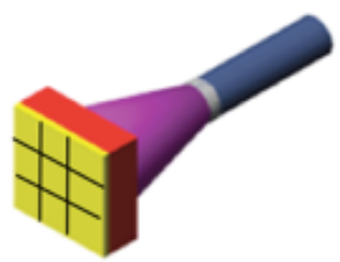


SiCsI Geometry

Total 58 detector units
($17.5^{o} < \theta_{lab} < 77.5^{o}$)
9 x 9 x 0.01 cm^3 Si (3 x 3 Pad)
9 x 9 x 5 cm^3 CsI (PMT readout)



Total 35 detector units
($78^{o} < \theta_{lab} < 150^{o}$)
15 x 15 x 0.01 cm^3 Si (3 x 3 Pad)
15 x 15 x 5 cm^3 CsI (PMT readout)



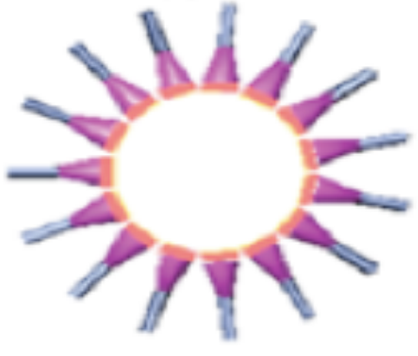
CsI(T1) cover polar angle 17.5° ~ 150°
17.5° ~ 77.5° : 4 detector pieces
(15° interval)

78° ~ 150° : 3 detector pieces
(24° interval)

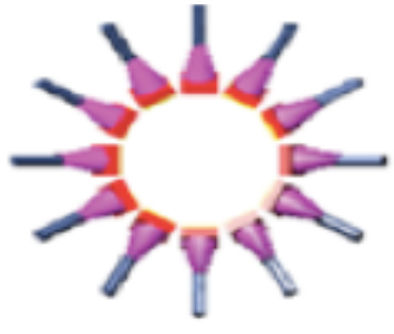
8units **12units** **18units** **20units**

25° **40°** **55°** **70°**

15units
90°



12units
114°

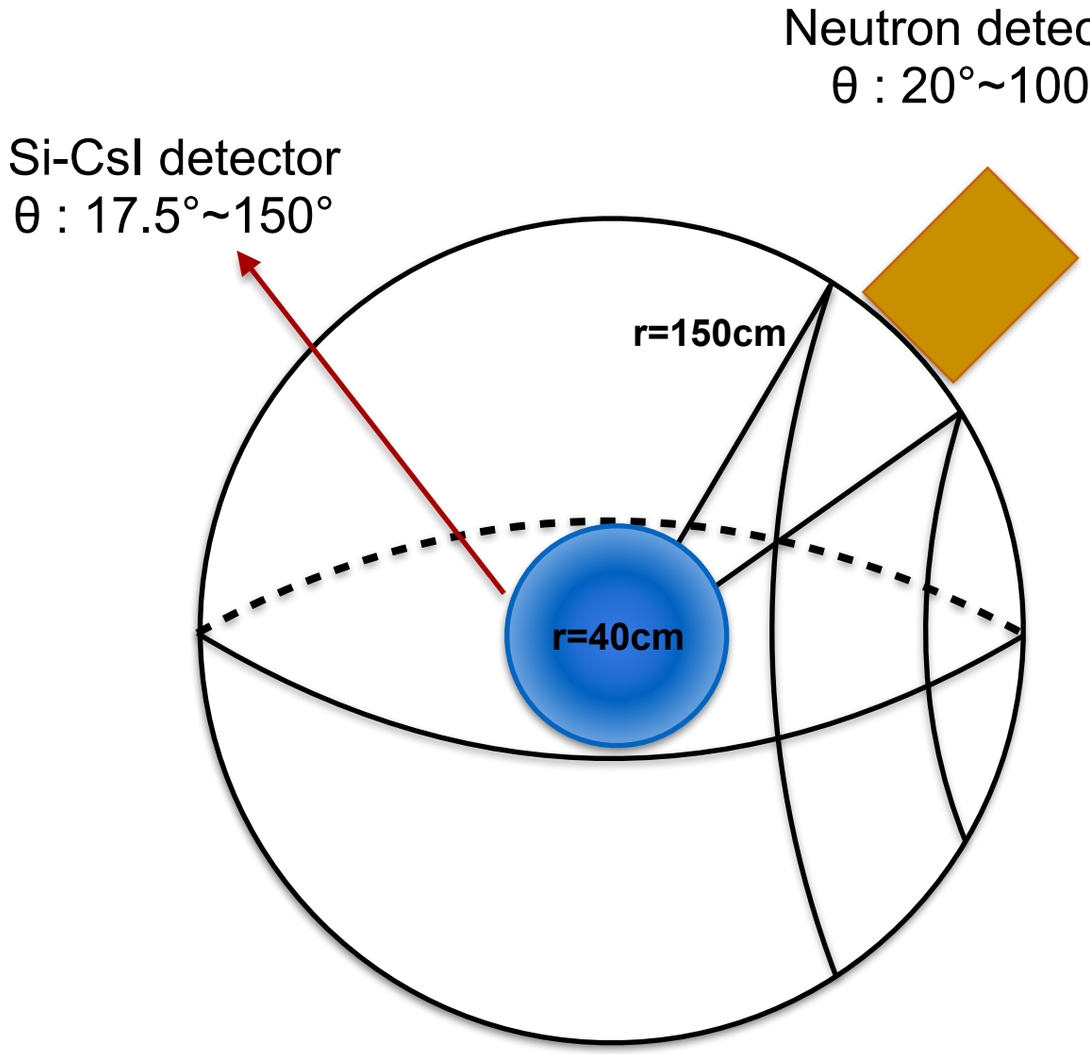


8units
138°

1st ring – change to vacuum

	N_gen(△θ)	N_det(△θ)	Det.CovRange (%) (simulation)	Det.CovRange (%) (geometrical)	# of particle/ Det.cell/event	Occupancy
1 : (17.5°<θ<32.5°)	2.67	1.53	57.25	58.43	0.191	0.0156
2 : (32.5°<θ<47.5°)	1.98	1.14	57.56	57.62	0.095	0.0077
3 : (47.5°<θ<62.5°)	1.17	1.14	66.88	67.81	0.063	0.0052
4 : (62.5°<θ<77.5°)	1.17	0.73	62.33	65.69	0.037	0.0030
5 : (77.5°<θ<102°)	1.10	0.84	76.36	79.11	0.056	0.0046
6 : (102°<θ<126°)	0.56	0.37	67.47	70.70	0.031	0.0025
7 : (126°<θ<150°)	0.25	0.14	57.03	64.35	0.018	0.0014

Neutron detector geometry



Neutron detecter size : 15x15x20cm^3

	# of Det.
ring 1 : 20° ~ 28°	20
ring 2 : 28° ~ 36°	30
ring 3 : 36° ~ 44°	36
ring 4 : 44° ~ 52°	43
ring 5 : 52° ~ 60°	49
ring 6 : 60° ~ 68°	53
ring 7 : 68° ~ 76°	57
ring 8 : 76° ~ 84°	60
ring 9 : 84° ~ 92°	61
ring 10 : 92° ~ 100°	61
all	470

Neutron detector geometry

Time of Flight

$$E_K = E_0[(1-v^2/c^2)^{-1/2} - 1]$$

$$E_K = E_0[(1-L^2/\triangle t^2 c^2)^{-1/2} - 1]$$

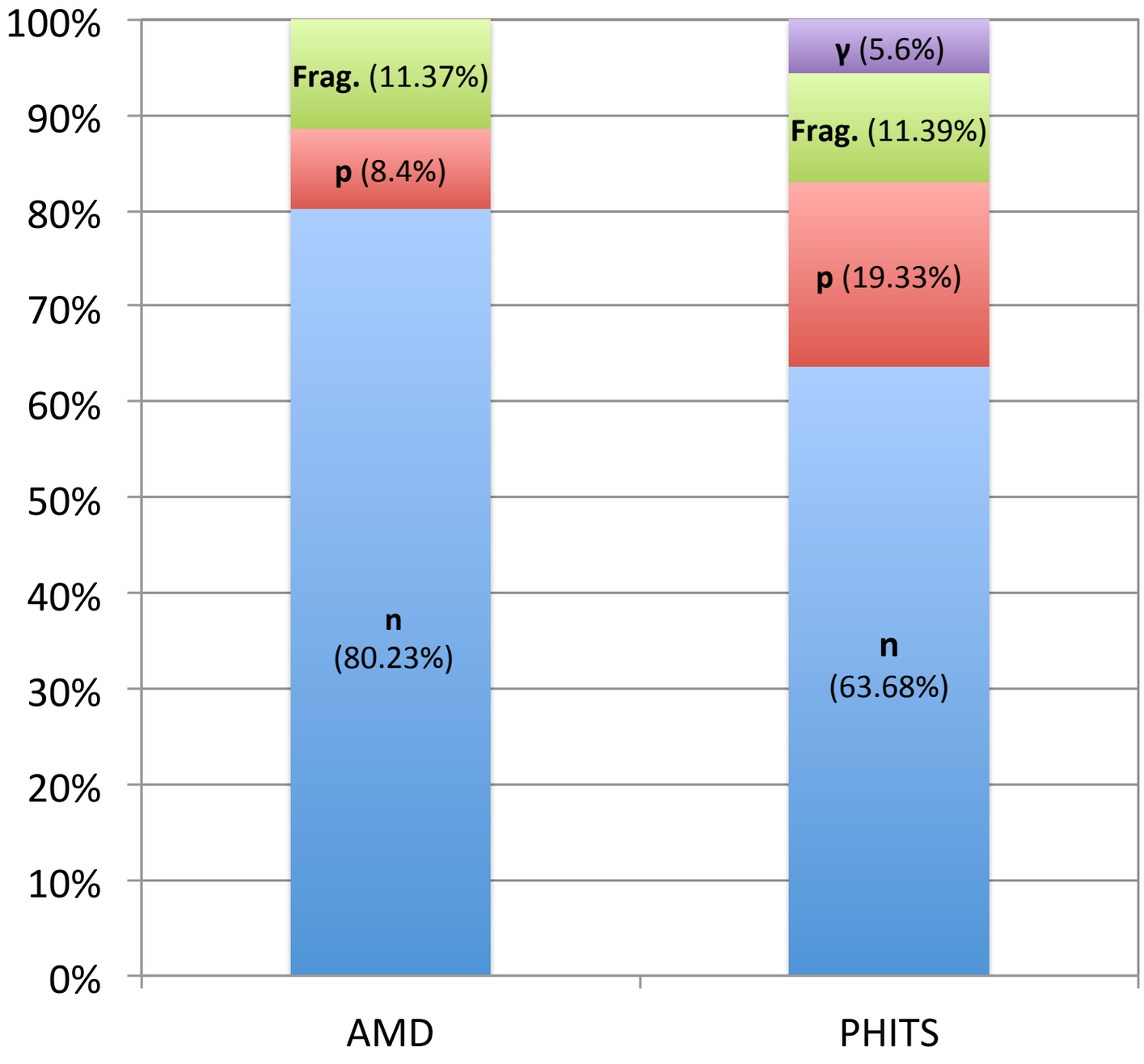
Plan

1. Neutron detector Geant4 simulation
    - All AMD events simulation -> E vs. time
    - Different energy region 3~7 MeV, 7~13 MeV, 13~18 MeV, 18~25 MeV
    - Different CsI thickness 5cm -> 2.5cm
    - All steps with and without Si-CsI detector

2. Si-CsI mass distribution fitting study - details in A&M and LNS

Back- up

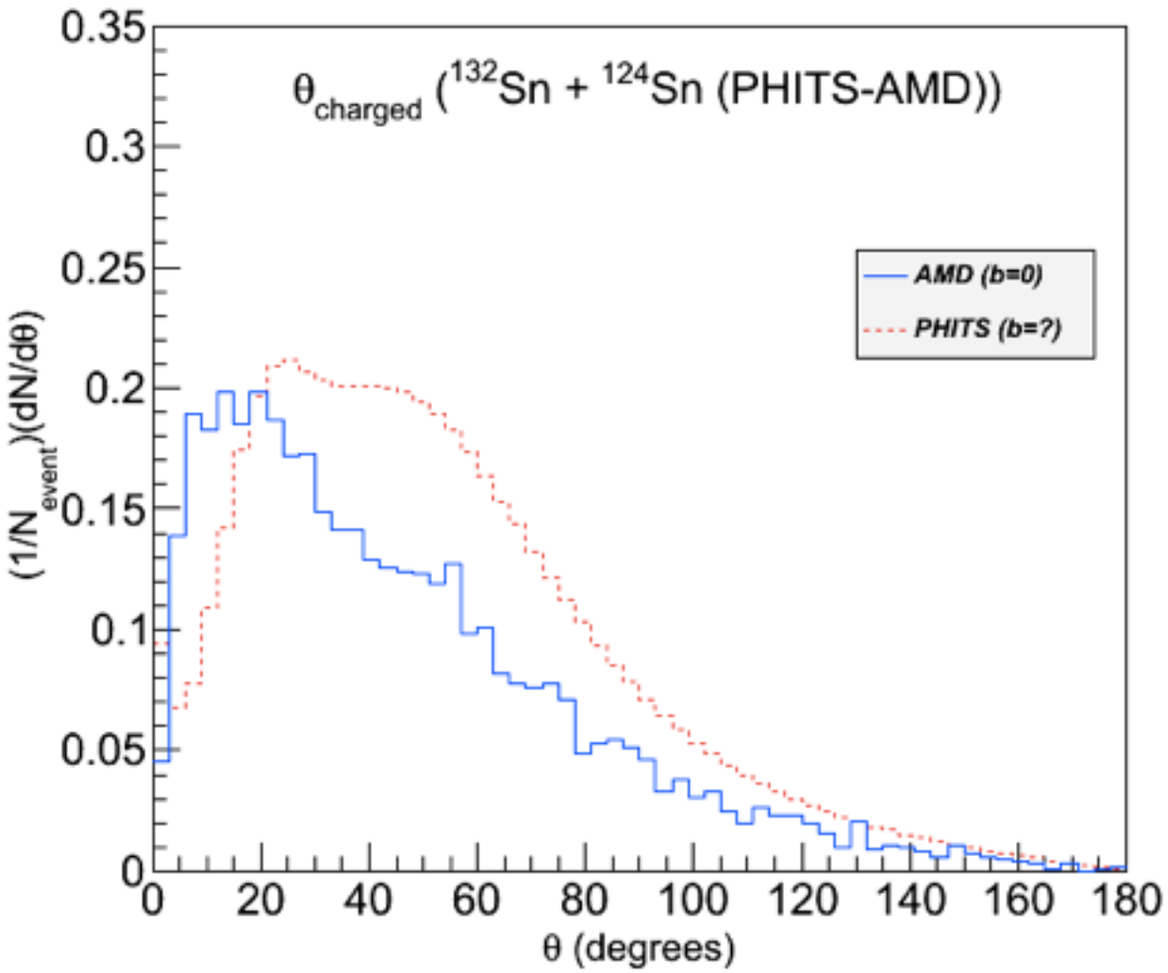
AMD & PHITS

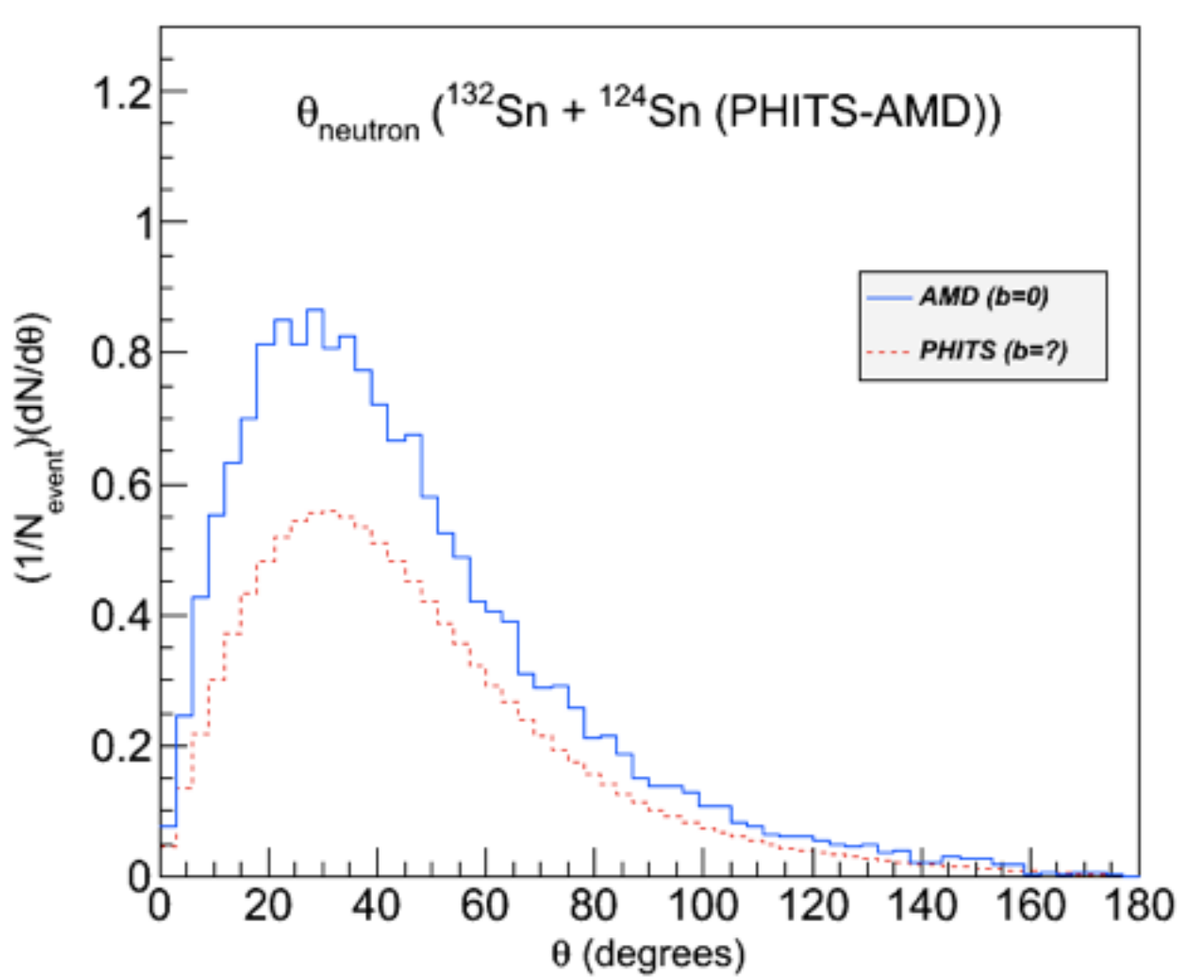


AMD : $^{132}Sn + ^{124}Sn$ - (20 MeV/u)
impact parameter : b = 0
N_{event}=2010

PHITS : $^{132}Sn + ^{124}Sn$ - (18.5 MeV/u)
impact parameter : wide
N_{event}=272018

AMD&PHITS – Theta Distribution (Charged/Neutron)





AMD&PHITS – Kinetic Energy (Charged/Neutron)