

Status Report of Beam Diagnosis Detector

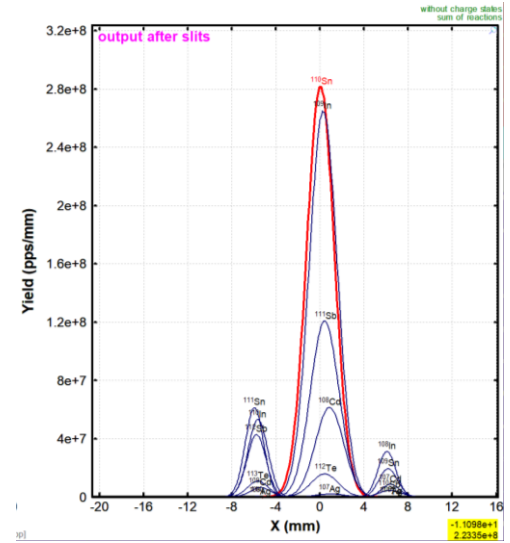
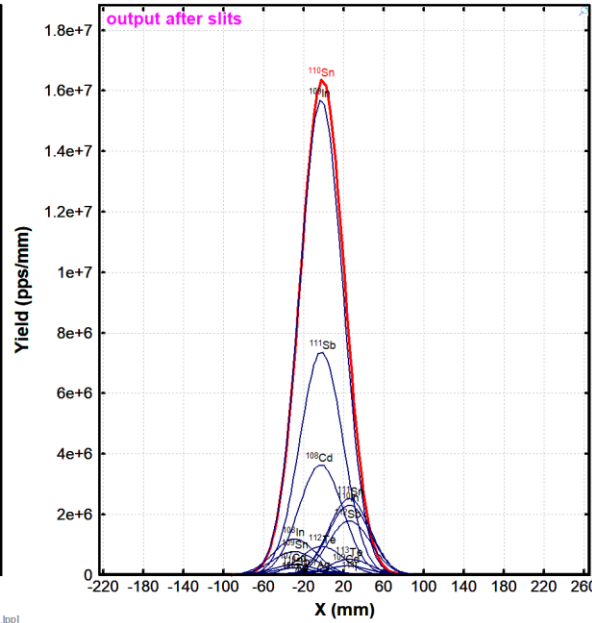
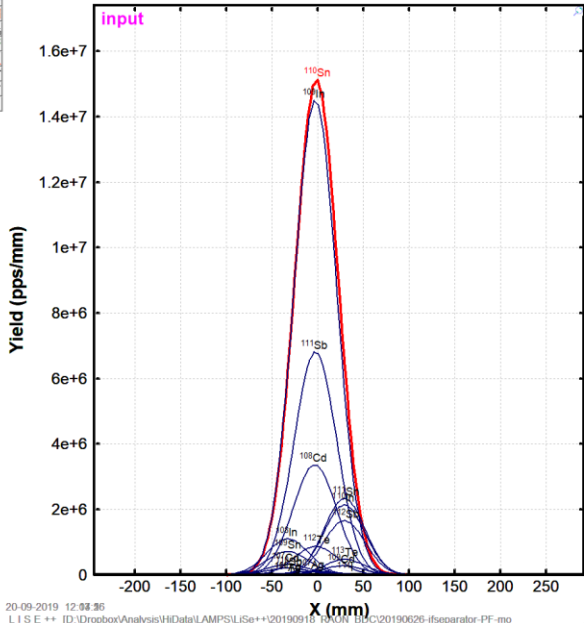


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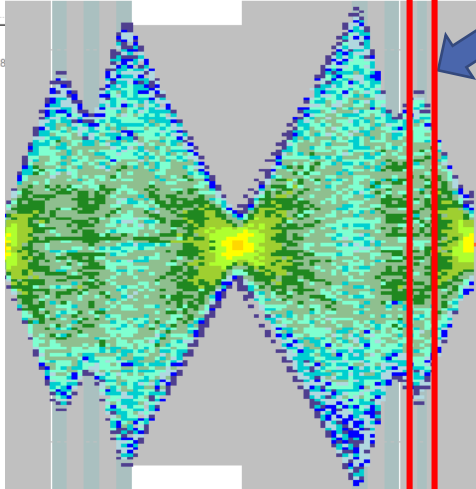
2019/09/20 LAMPS Collaboration Meeting

LQM6 => Xspace

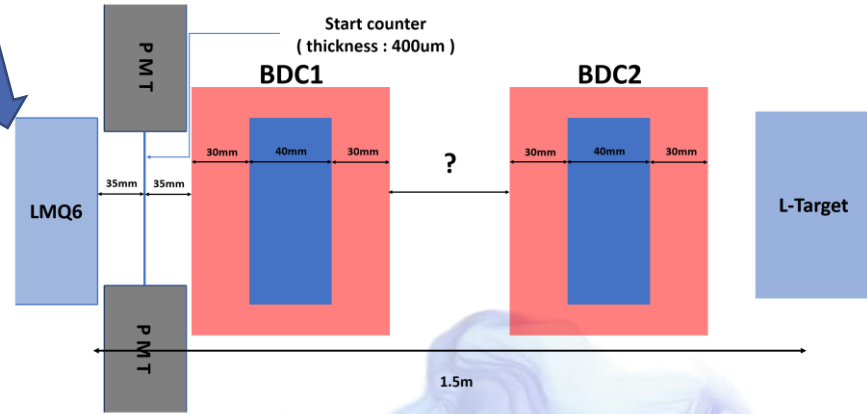
^{124}Xe (260 MeV/u) + C (2.5 mm); Settings on ^{110}Sn ; Config: SSSSSSSSDSSSSSSSSSDSSSSS...
dp/p=7.56%; Wedges: Al (1800 μm); Brho(TM): 4.8435, 4.8435, 4.8435, 4.3111, 3.9277....



Beam size at Target (x)
: +/- 4.2 mm



^{238}U beam
is ongoing



BDC Construction

- Prototype Design

Configuration : xx'yy' (4 planes)

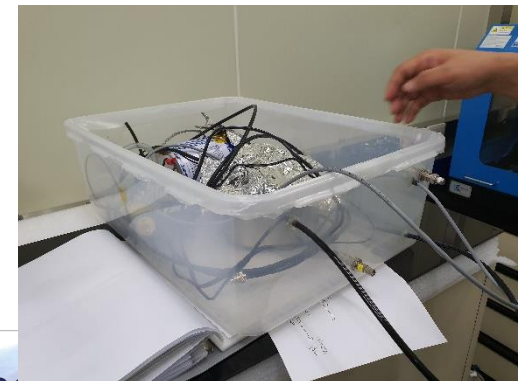
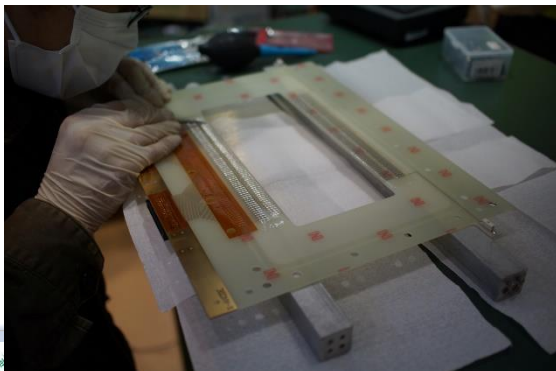
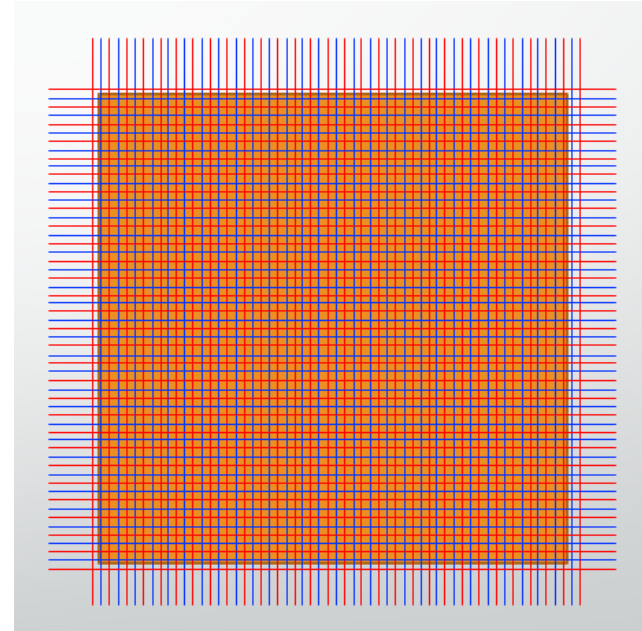
Sensor Wire : 32ch

Potential Wire : 33ch

Drift Length : 2.5 mm

$32 * 2.5 * 2 = 160$ mm

Active Area : 160 x 160 mm²



BDC Construction

- NIM Crate & Power Supply & SH Cable



Place for wiring



Summary & Plan

- Wire (16mum, Gold coated Tungsten) : 사업단에서 빌리기로 함
- Gas flow system : 구매 계획
- DAQ system : 이효상 박사님께 문의 ?
- Time line
 - 9월 – 10월 초 : Wire 기판 제작
 - 10월 말 : Wiring
 - 11월 : Chamber construction
 - 12월 : Cosmic Muon Test

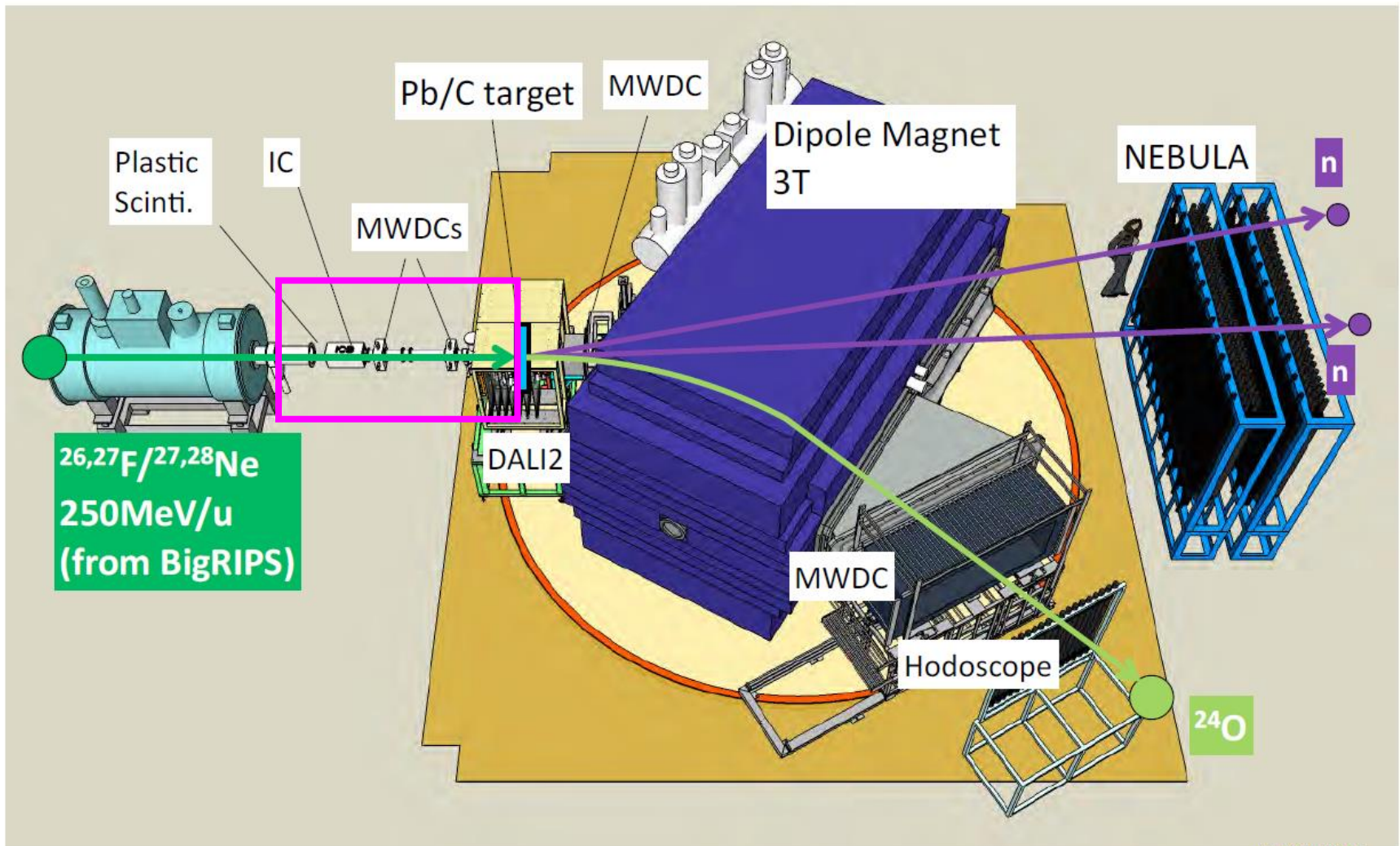


**Thank You Very Much
for your attention !**



Back Up

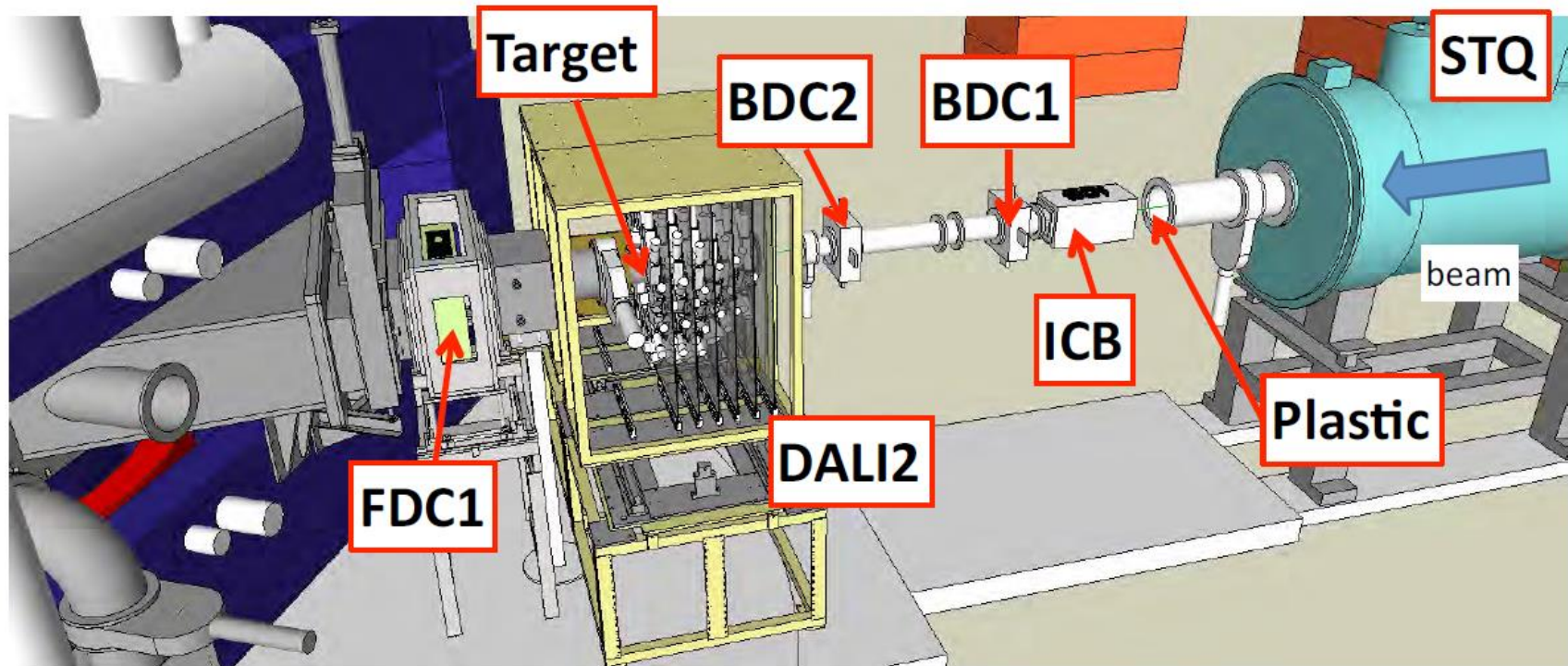
SMURAI Detector



SAMURAI

Beam Profile Detector in SMURAI

- Detectors for incoming beams: beam position (BDC), PID(Plastic and ICB), γ (DALI2) and tracking detector(FDC1) for electro-magnetic spectroscopy at SAMURAI.



SMURAI BDC (Beam Drift Chamber)

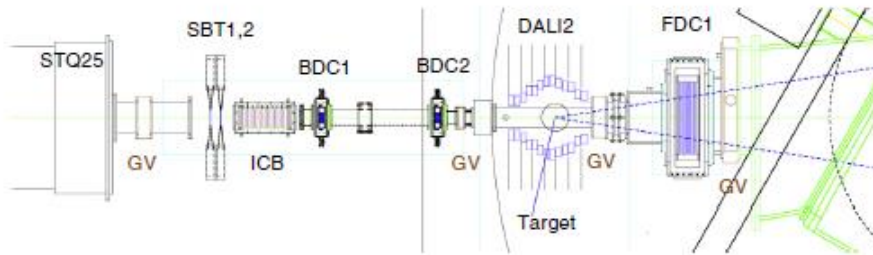


Fig. 6. Expanded view of the upstream part of the experimental setup.

NIMB 317 (2013) 294-304

- Walenta type Drift chamber
- 2.5 mm drift length
- $i\text{-C}_4\text{H}_{10}$ at 50-100 torr
- Anode, potential wire diameter of $20\ \mu\text{m}$ (Au-W), $80\ \mu\text{m}$ (Au-Al)
- Cathode (gas window) $8\ \mu\text{m}^t$ Al-Kapton
- Effective area : 8 cm x 8 cm

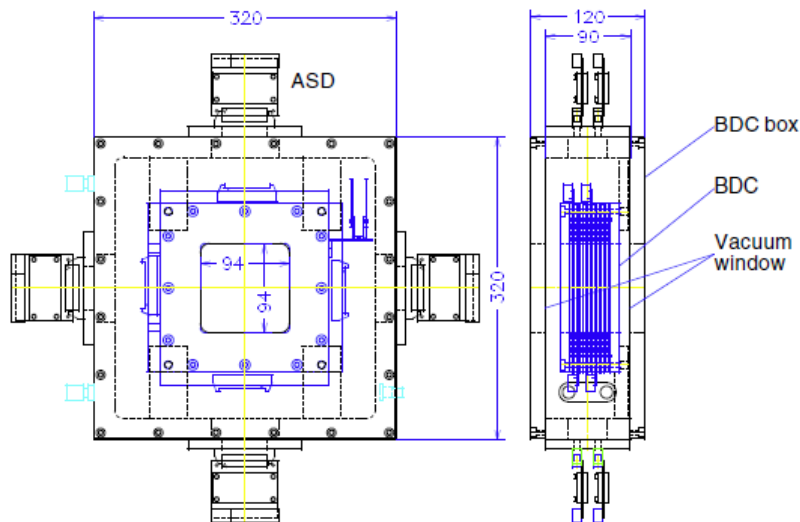


Fig. 9. Schematic view of the BDC and the BDC box.

SMURAI BDC (Beam Drift Chamber)

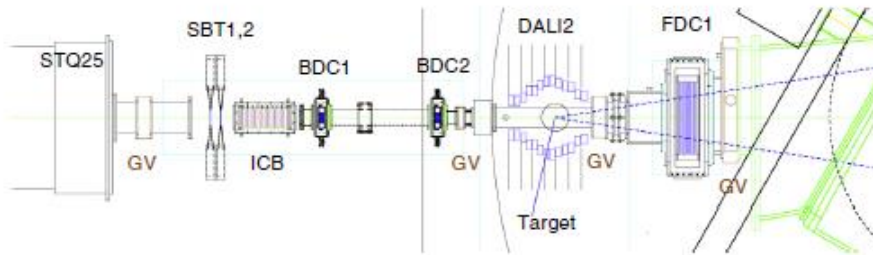
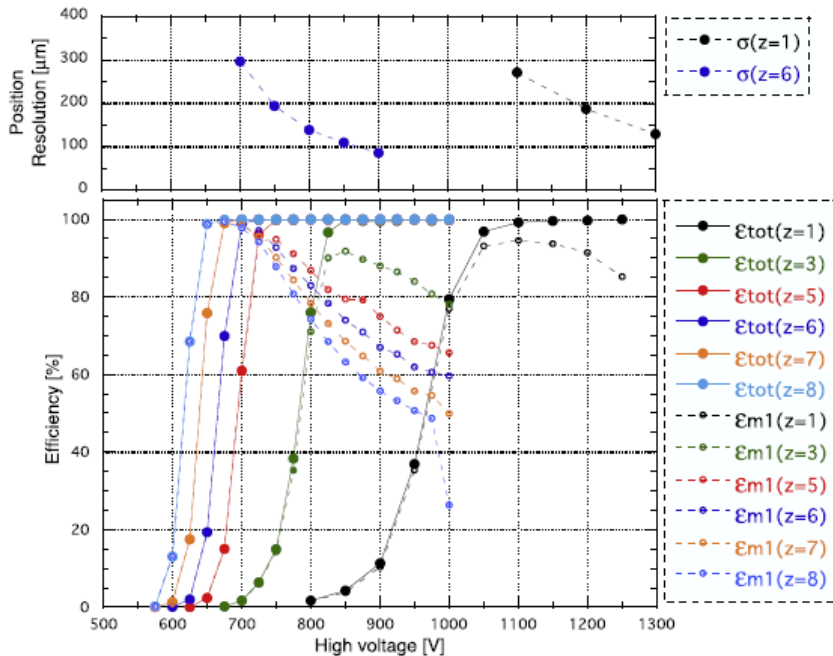


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Requirements

- Position resolution : $\sim 100\ \mu\text{m}$
- Efficiency : 100 % at $> 600\ \text{V}$

SMURAI BDC (Beam Drift Chamber)

- Beam Rate Estimation : LiSe++ (Seonghak Lee)

Fragment	Decay Type	Primary beam (400 kW)		Production Reaction	RI beam energy	RI beam Intensity	RI Beam purity
		Type	에너지 (MeV/u)		(MeV/u)	(pps)	(%)
132Sn	Beta- decay	238U	200	in-flight fission	133.2	8.21E+06	1.4661
130Sn	Beta- decay	238U	200	in-flight fission	133.1	3.74E+08	13.6
124Sn	stable	124Sn	230	transmission	230	8.77E+13	100
112Sn	stable	112Sn	263	transmission	263	8.49E+13	100

- Expected Beam : ^{132}Sn : $8 \times 10^{+6}$ pps with 133.2 MeV/u
- To determine specific conditions of Drift Chamber, we will use GarField program (Dr. Hwang with Seonghak Lee)