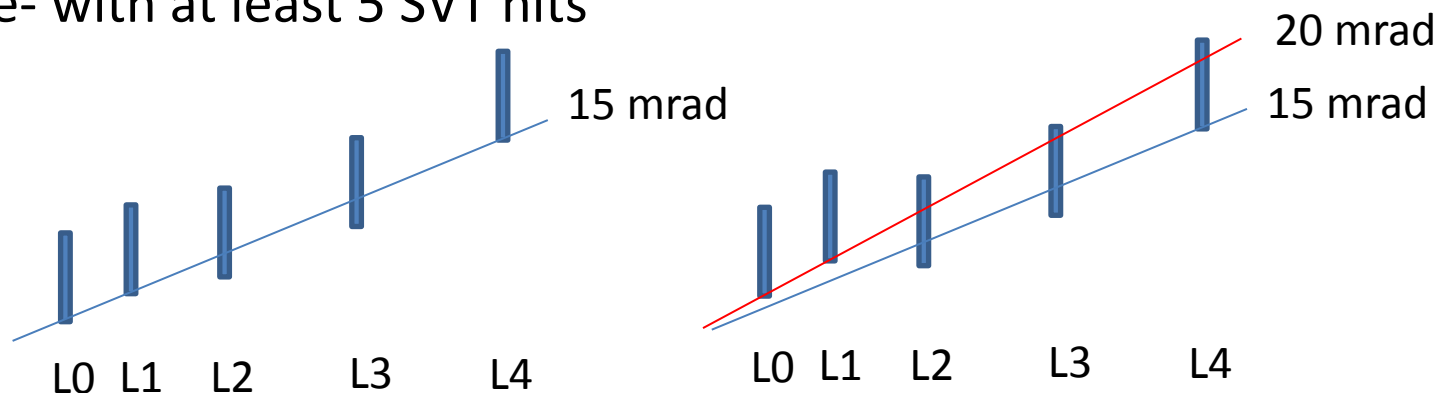# Acceptance vs. Zvtx

- 4.4 GeV A' decays
- SVT
  - L2/L3 moved by 0.7 mm
  - L1: L0 sensor with no move.
- Acceptance for θy > 15, 17.5 and 20 mrad.
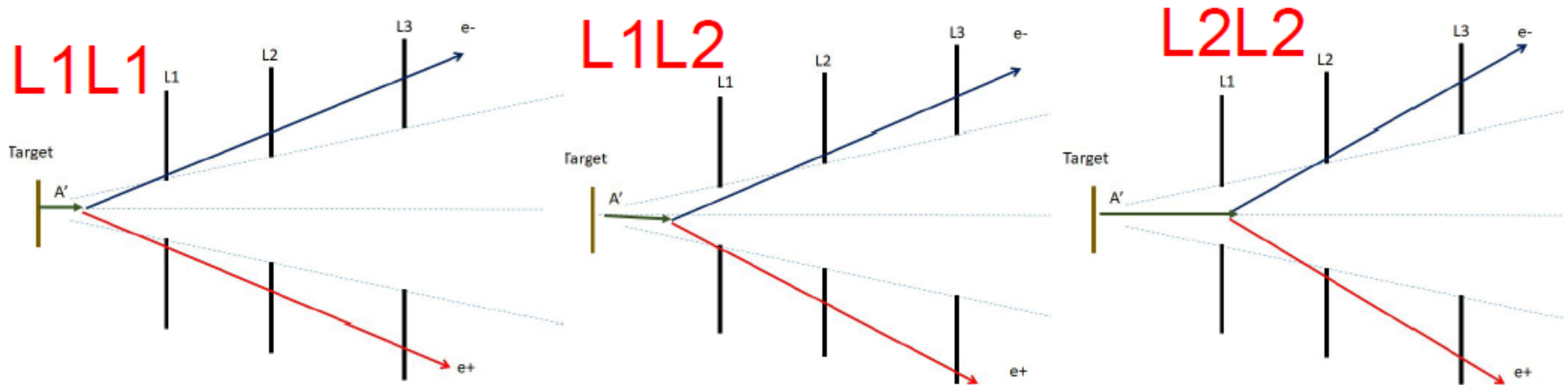 - e+ in ECal active region with at least 5 SVT hits
  - e- with at least 5 SVT hits

Zvtx	0, 2, 4, 6, 8 cm
θy	15, 17.5, 20 mrad
A' Mass	50, 75, 100, 125, 150, 200, 225, 250, 275, 300 MeV

- "L0L0", "L0L1", and "L1L1" separately.
  - "L0": hit in active L0
  - "L1": hit in active L1 and no hit in active L0.
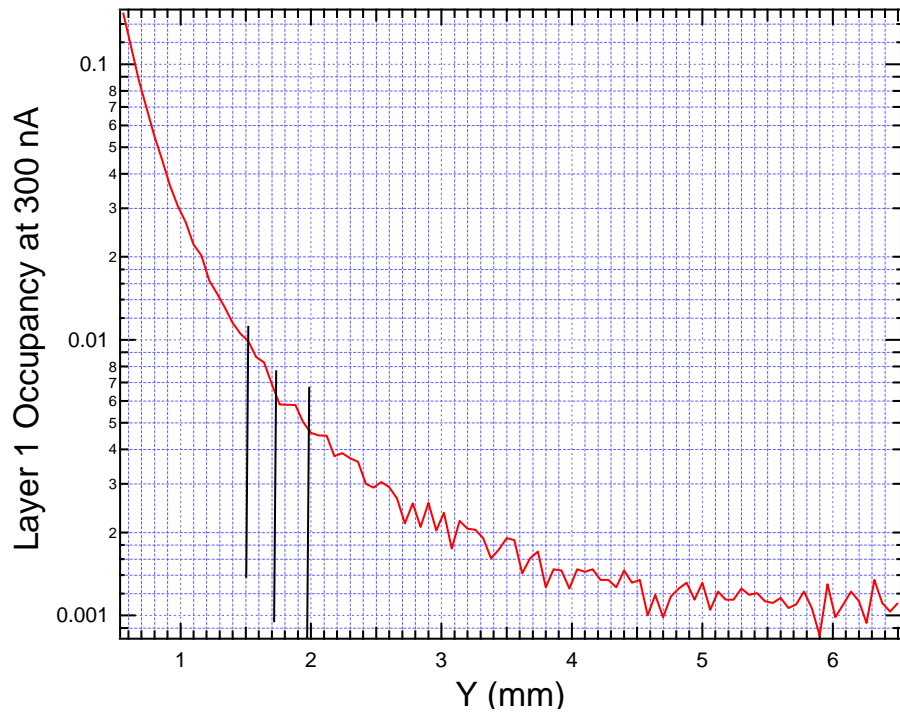
Dividing the Vertex Analysis into Categories (Holly/Matt)

Vertex analysis is divided into mutually exclusive categories based on which particles hit which layers
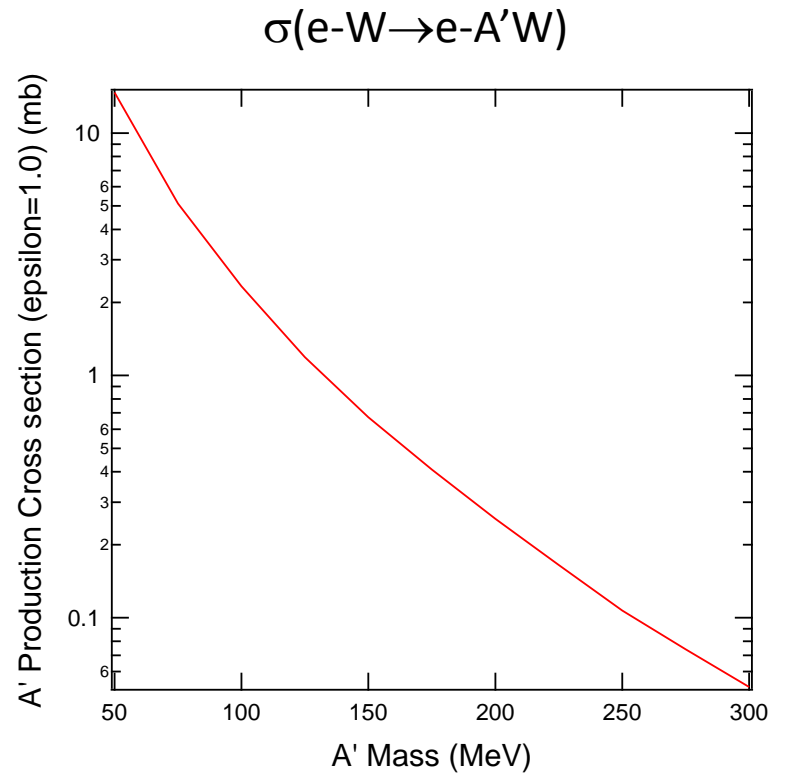
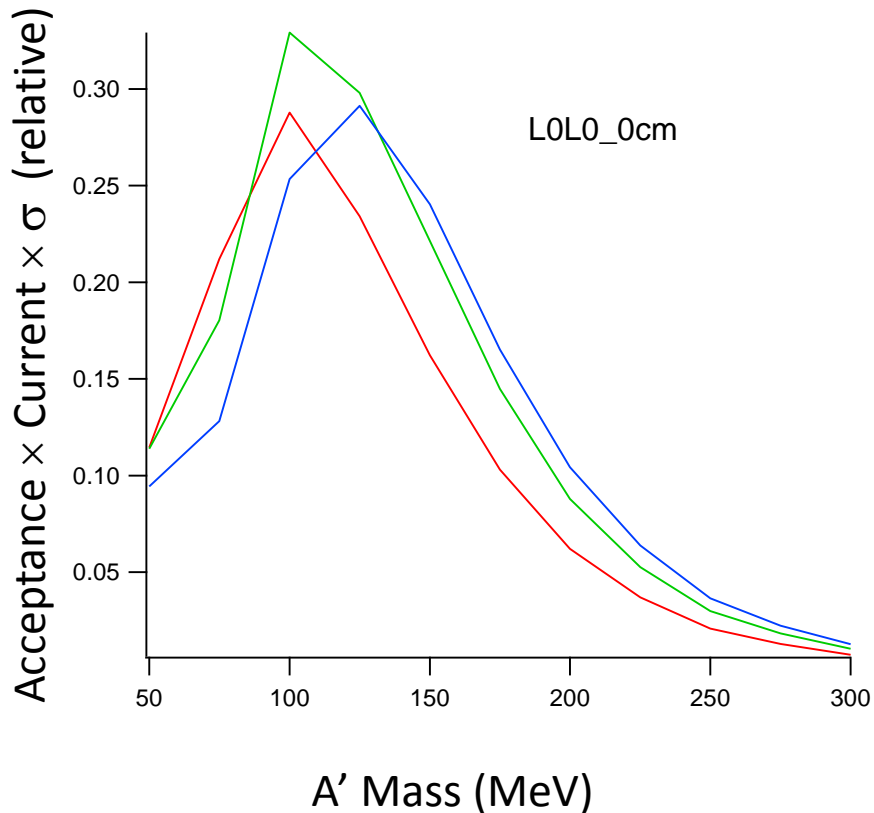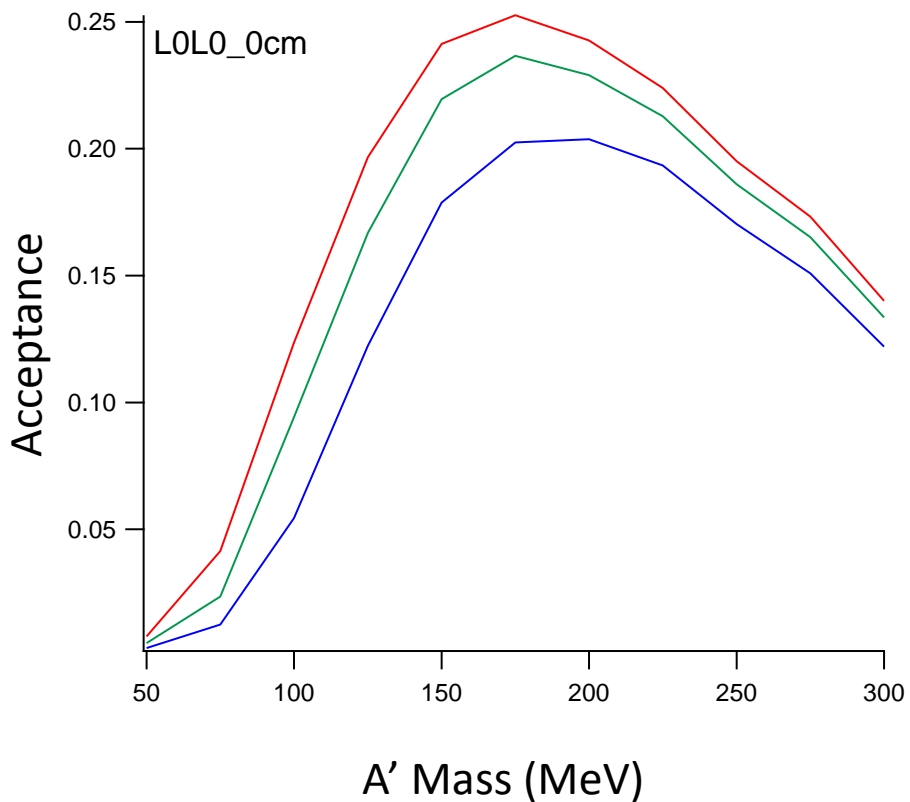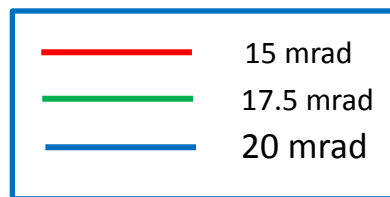L1L2/L2L2 capture the longer-lived A's, improve low ε reach

Layer 1 Occupancy at 4.4 GeV and 0.25% X_0 Target

$\sigma(\text{e-W}\to\text{e-A'W})$
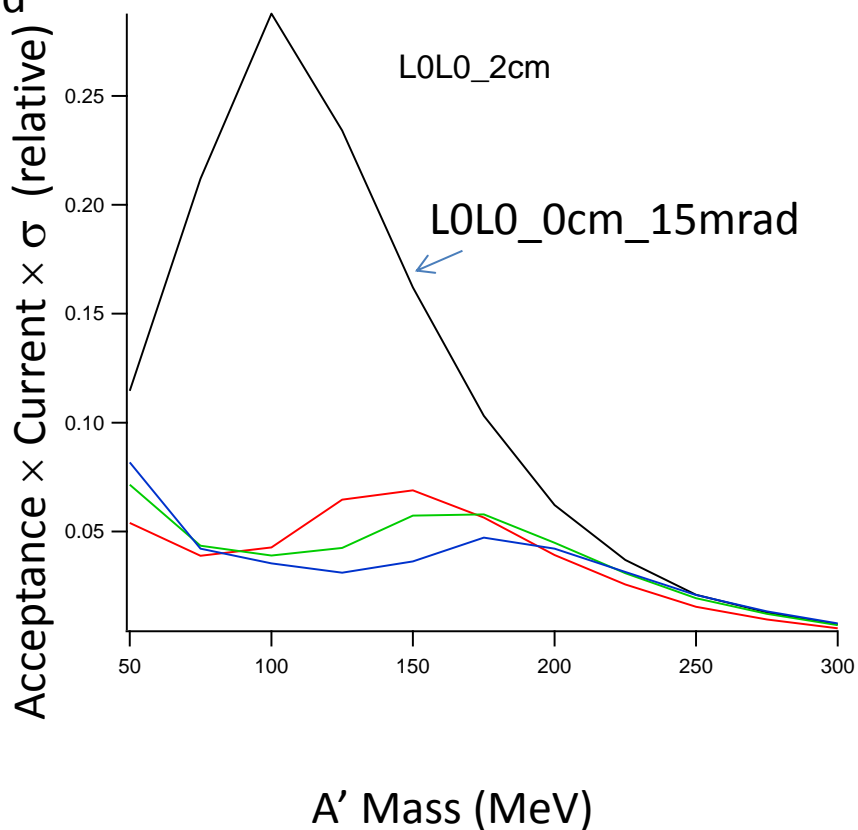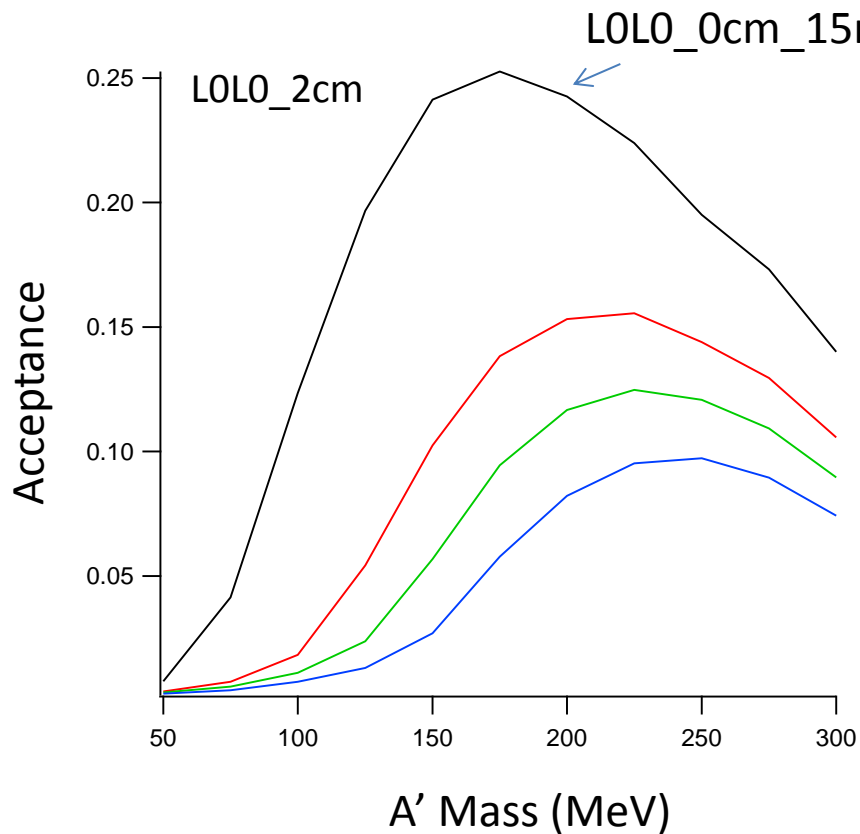

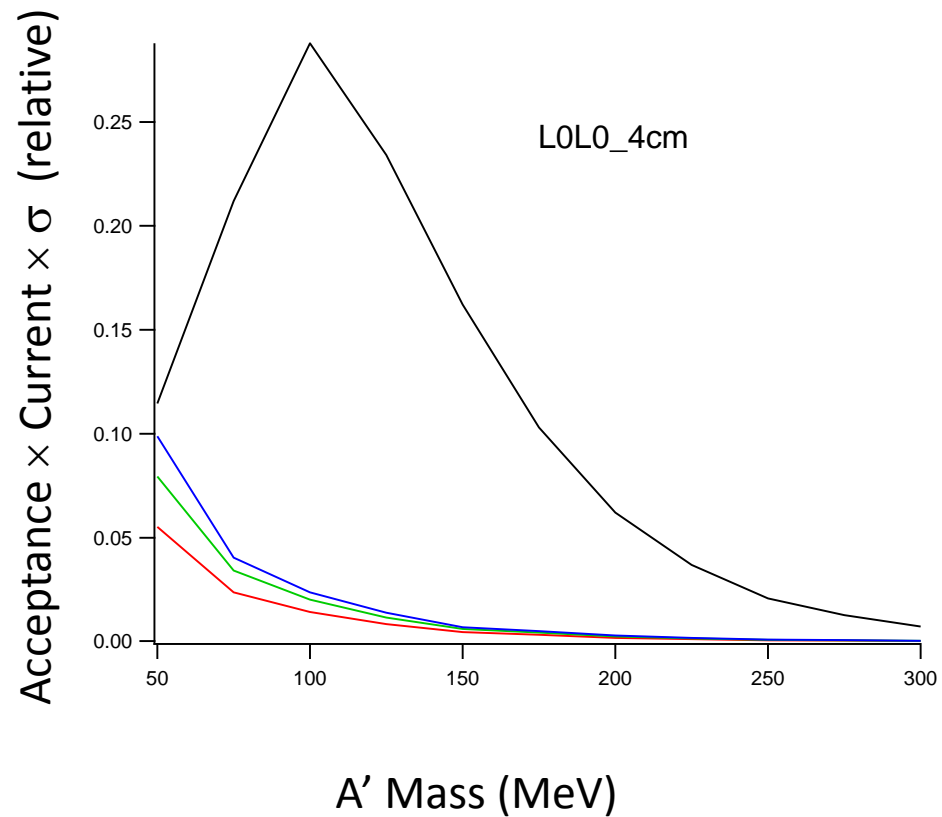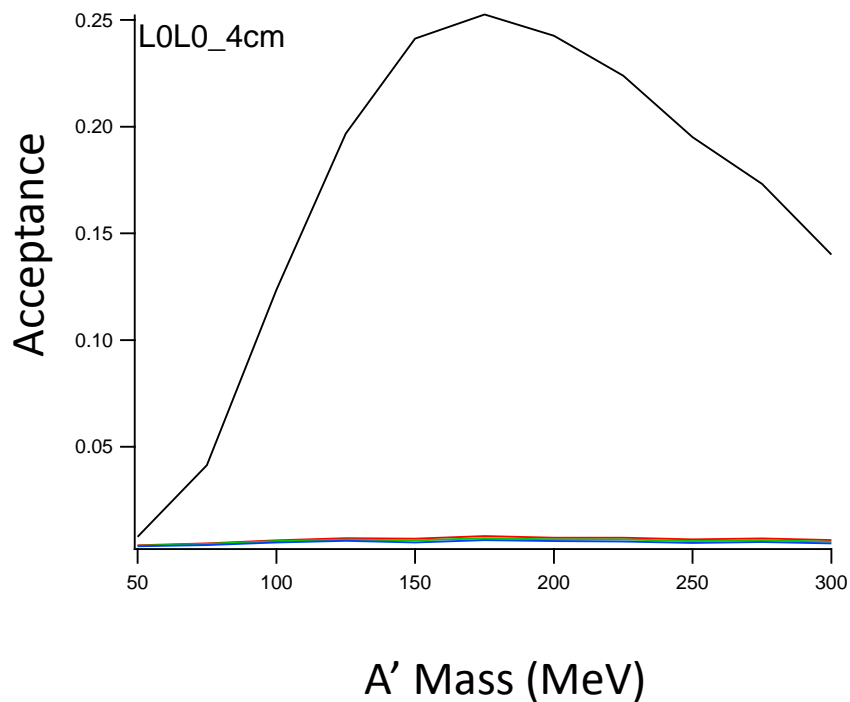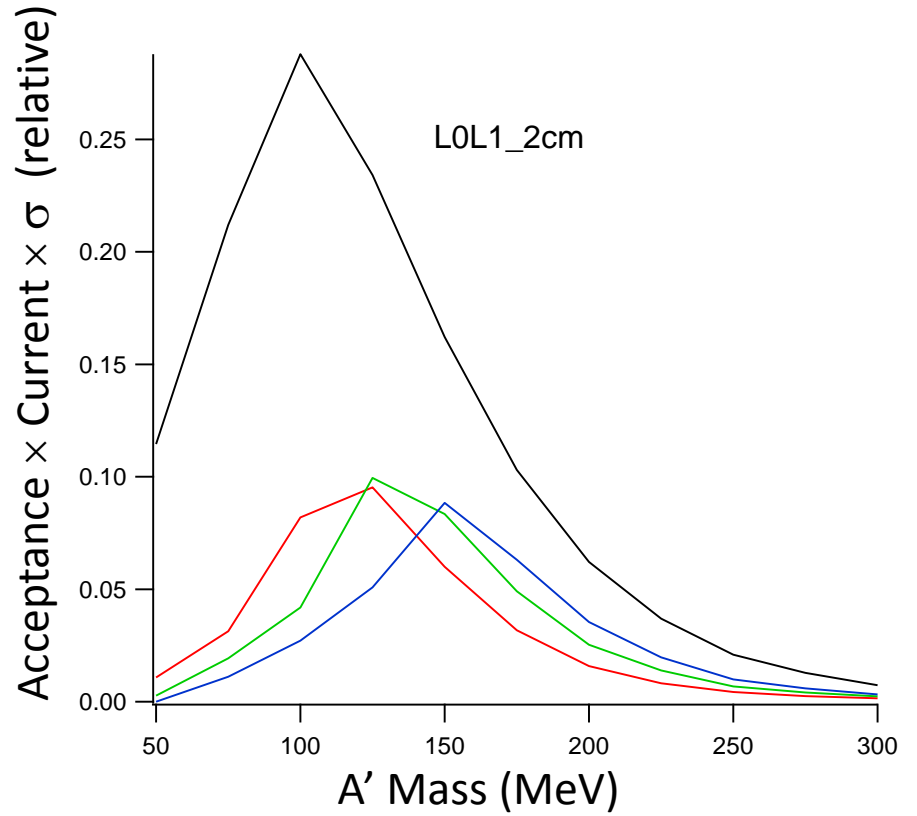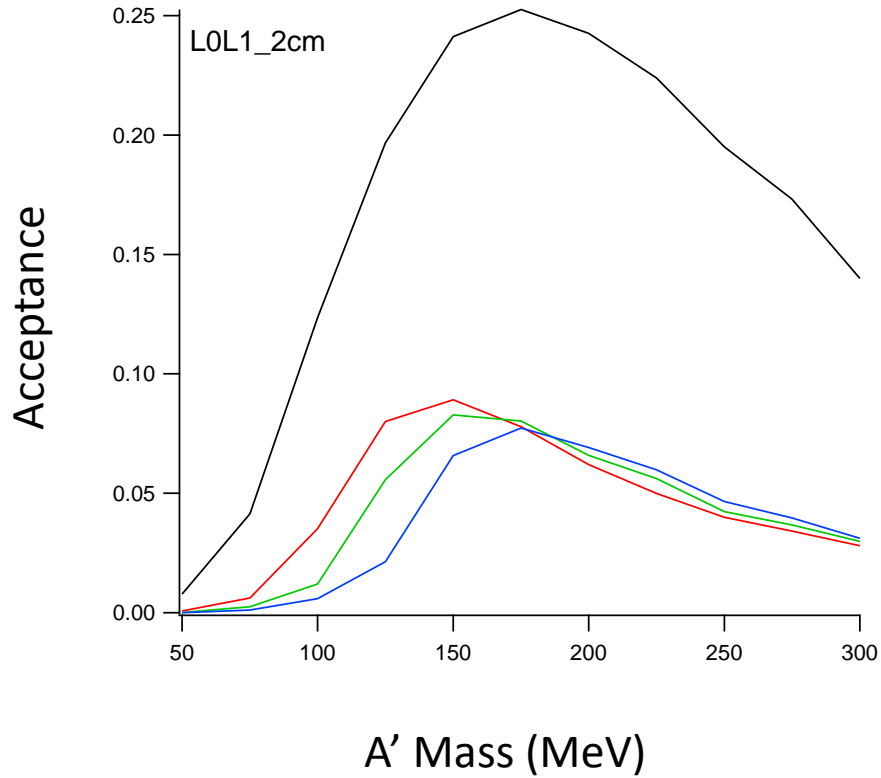| Y (mm)	Occupancy @ 300nA	Beam Current for 1% occupancy
1.5	1%	300nA
1.75	0.65	450
2.0	0.5	600

L0L0   Z=0 cm

Legend:
- 15 mrad (red)
- 17.5 mrad (green)
- 20 mrad (blue)

Left plot: L0L0_0cm — Acceptance vs A′ Mass (MeV)

Right plot: L0L0_0cm — Acceptance × Current × σ (relative) vs A′ Mass (MeV)

L0L0   Z=2 cm

Left panel: Acceptance vs A' Mass (MeV). Labels: L0L0_2cm, L0L0_0cm_15mrad.

Right panel: Acceptance × Current × σ (relative) vs A' Mass (MeV). Labels: L0L0_2cm, L0L0_0cm_15mrad.
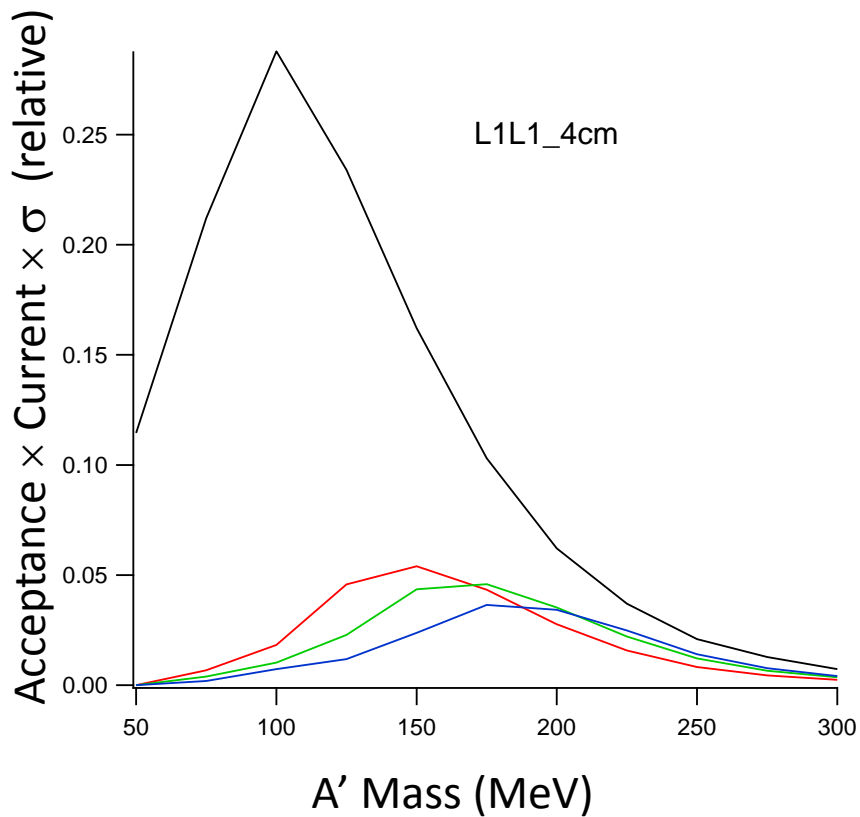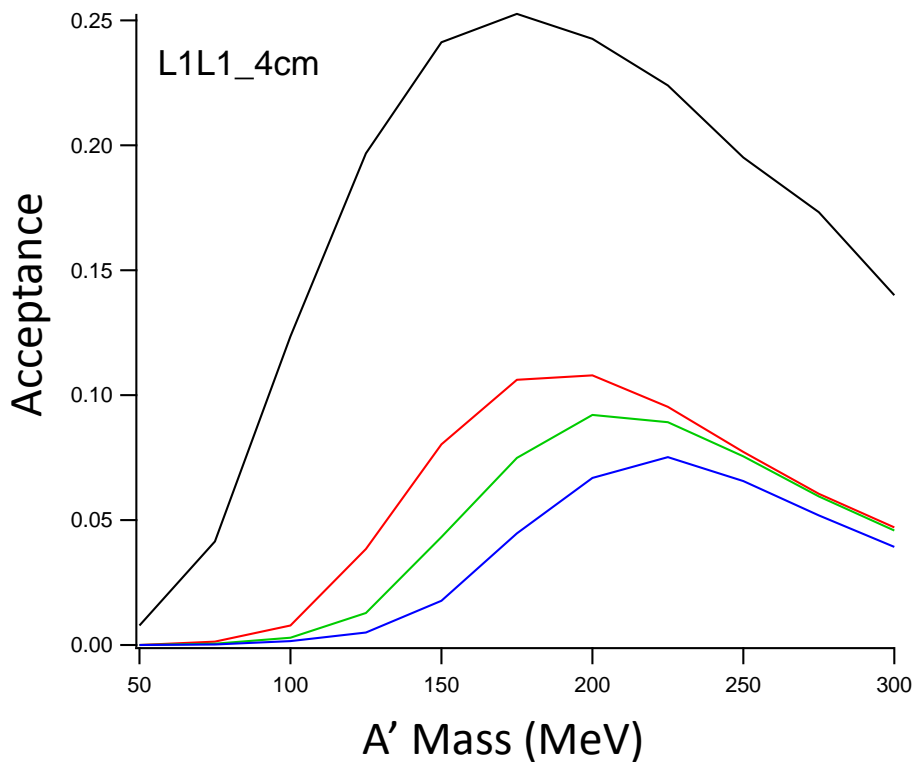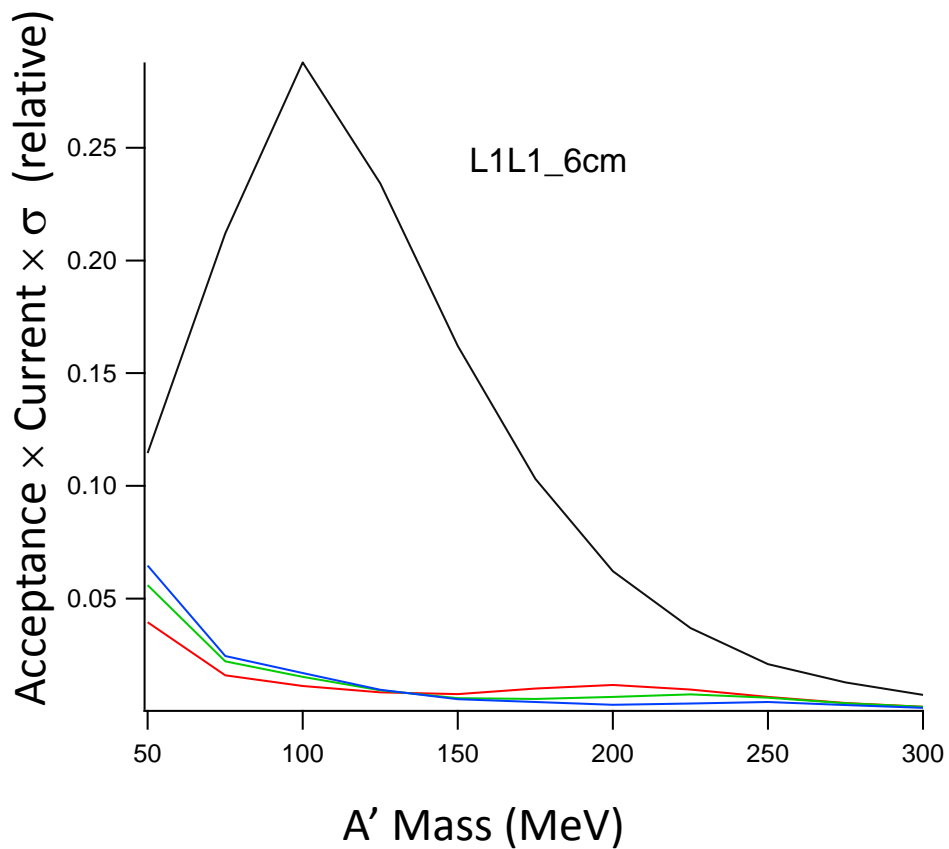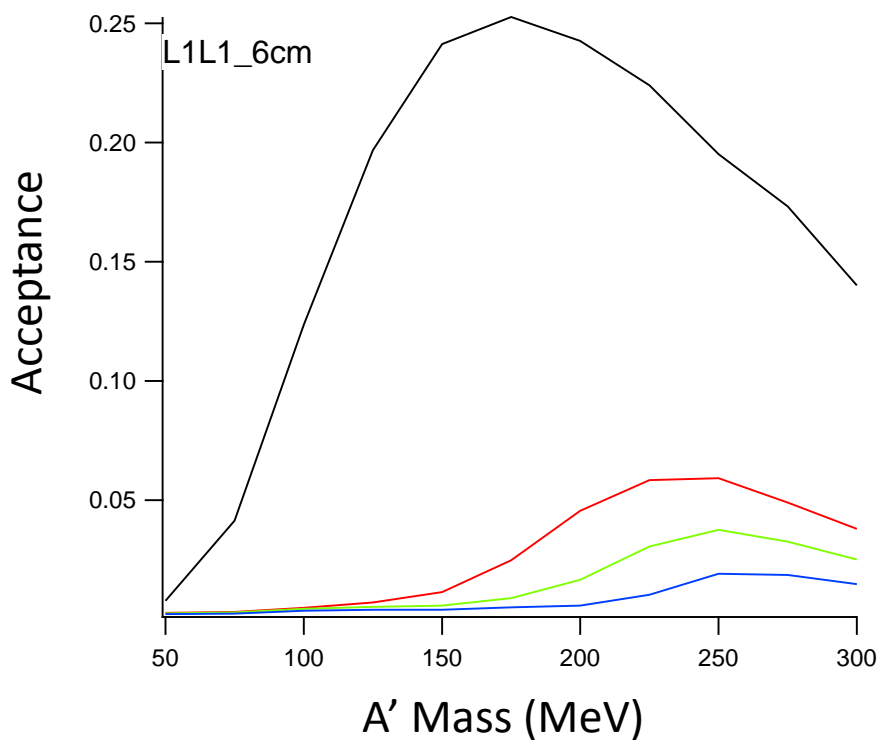
L0L0   Z=4 cm

L0L1   Z=2 cm

L0L1   Z=4 cm

L1L1   Z=2 cm

L1L1   Z=4 cm

L1L1   Z=6 cm

L1L1   Z=8 cm

L1L1_8cm

Acceptance vs A' Mass (MeV)

L1L1_8cm

Acceptance × Current × σ (relative) vs A' Mass (MeV)