

UPDATE 17
2020-05-10

CATHODE + MESH
(fixed macro + edep histos)

#alpha entering gas

		T = 30%		T = 60%	
	no mesh	3 + 6	6 + 6	3 + 6	6 + 6
total	11769	30099	29106	23397	22534
<u>from cathode</u>	11769	11822	12010	11935	11985
FWD not cross	11757	11174	12001	10364	11974
FWD cross	-	648	0	1571	1
BWD	12	3	9	6	10
<u>from mesh</u>	-	18274	17096	11456	10549
FWD	-	8568	8260	5536	5118
BWD	-	9706	8836	5920	5431

#lithium entering gas

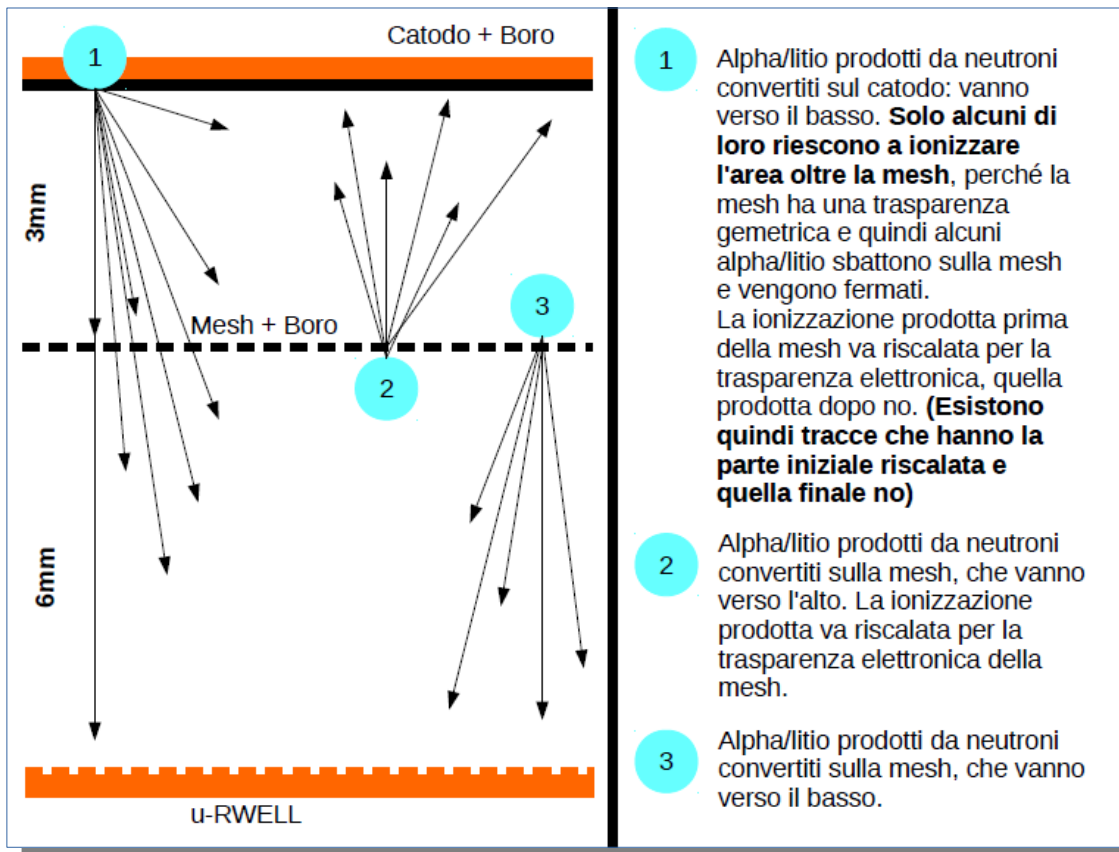
		T = 30%		T = 60%	
	no mesh	3 + 6	6 + 6	3 + 6	6 + 6
total	?	13719	13099	10858	10205
<u>from cathode</u>	?	5365	5349	5359	5177
FWD not cross	?	5363	5346	5346	5163
FWD cross	-	2	0	2	0
BWD	?	10	3	11	14
<u>from mesh</u>	-	8344	7750	5499	5028
FWD	-	3931	3699	2585	2451
BWD	-	4413	4051	2914	2577

Current calculation

Without the mesh:

$$i = \Phi * \varepsilon * N_{\text{ION}} * G * S$$

- i = current (C s^{-1})
- Φ = neutron flux ($758 \text{ cm}^{-2} \text{ s}^{-1}$)
- ε = efficiency = $\#\alpha \text{ seen} / \#\text{neutrons}$ → from simulation
- $N_{\text{ION}} = \# \text{ ele from ionization} = \text{primaries \& secondaries} = E_{\text{DEP}} / E_{\text{ION}}$
- G = gain
- S = surface $10 \times 10 \text{ cm}^2$



1 Alpha/litio prodotti da neutroni convertiti sul catodo: vanno verso il basso. **Solo alcuni di loro riescono a ionizzare l'area oltre la mesh**, perché la mesh ha una trasparenza geometrica e quindi alcuni alpha/litio sbattono sulla mesh e vengono fermati.

La ionizzazione prodotta prima della mesh va riscalata per la trasparenza elettronica, quella prodotta dopo no. **(Esistono quindi tracce che hanno la parte iniziale riscalata e quella finale no)**

2 Alpha/litio prodotti da neutroni convertiti sulla mesh, che vanno verso l'alto. La ionizzazione prodotta va riscalata per la trasparenza elettronica della mesh.

3 Alpha/litio prodotti da neutroni convertiti sulla mesh, che vanno verso il basso.

With mesh, there are four contributions:

1- α from cathode not crossing the mesh

$$i_1 = \Phi * \varepsilon_1 * N_{\text{ION},1} * G * S * T_{\text{ELE}}$$

2- α from cathode crossing the mesh

$$i_2 = \Phi * \varepsilon_2 * N_{\text{ION},2} * G * S$$

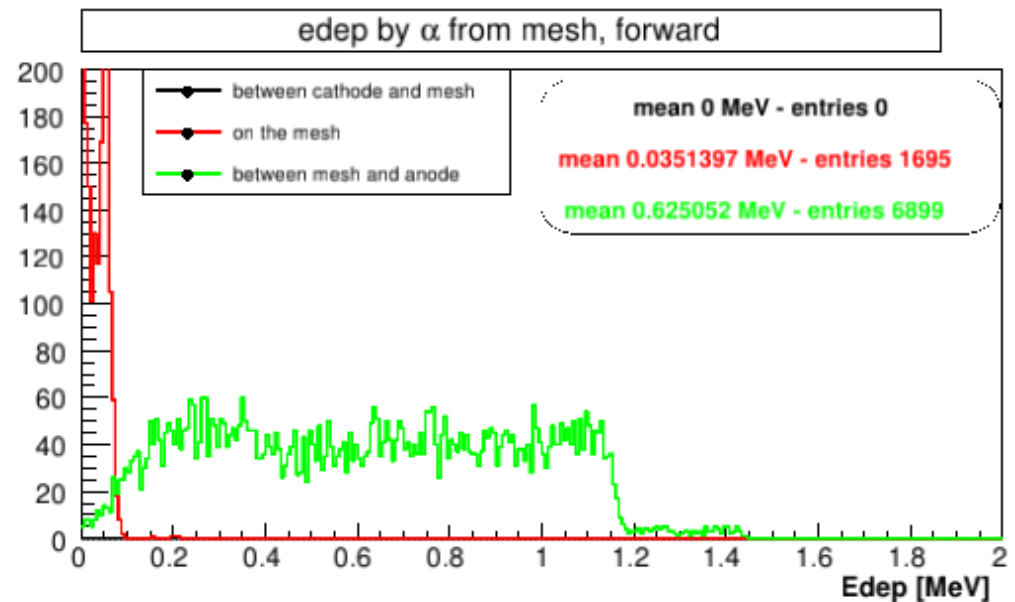
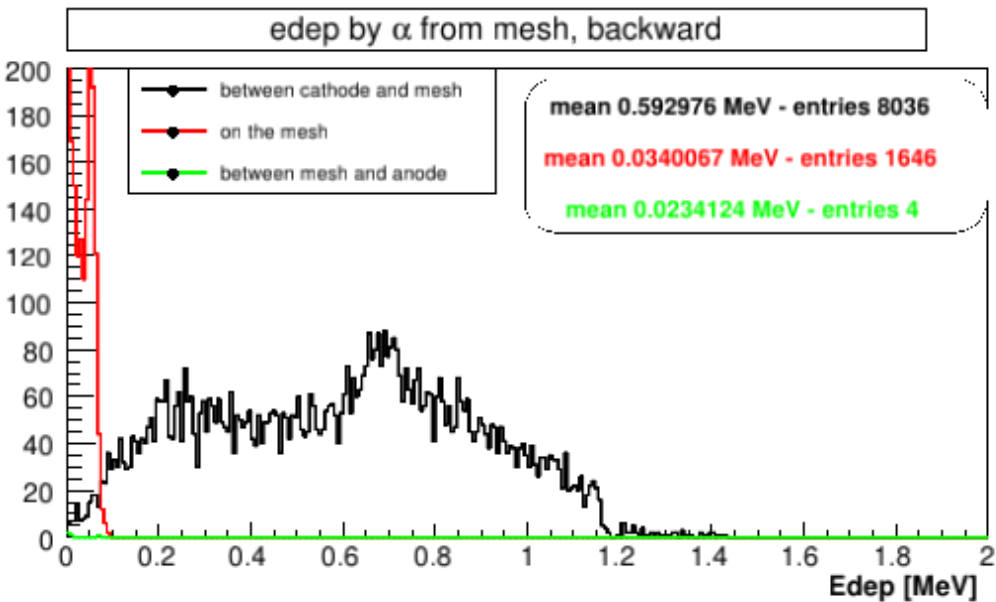
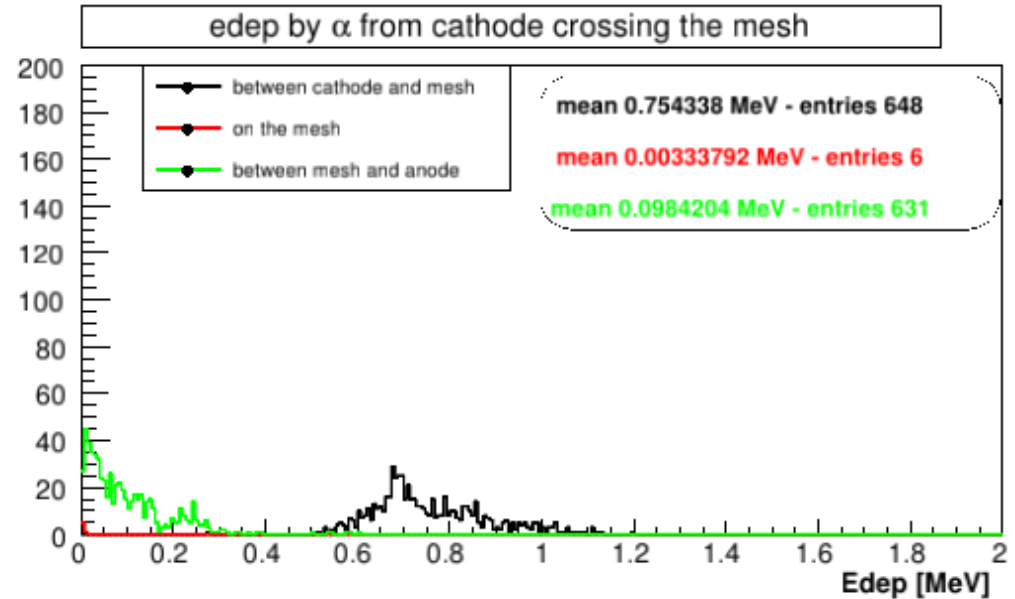
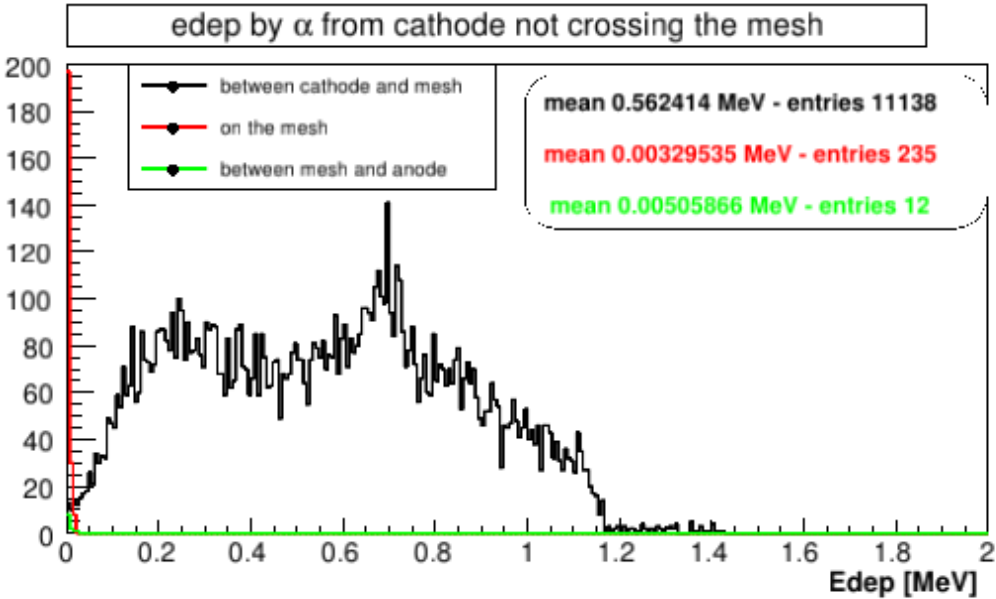
3- α from mesh forward

$$i_3 = \Phi * \varepsilon_3 * N_{\text{ION},3} * G * S$$

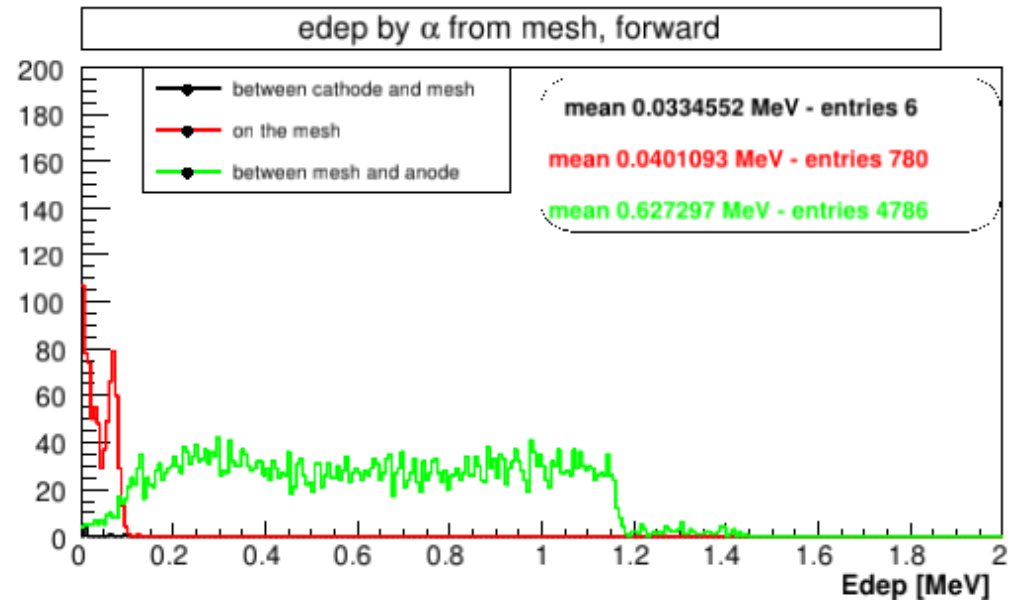
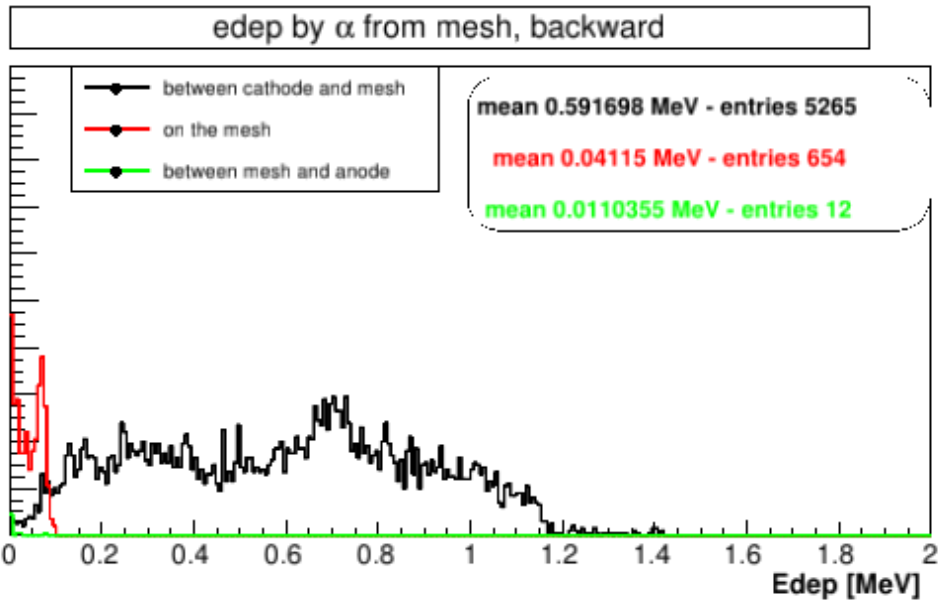
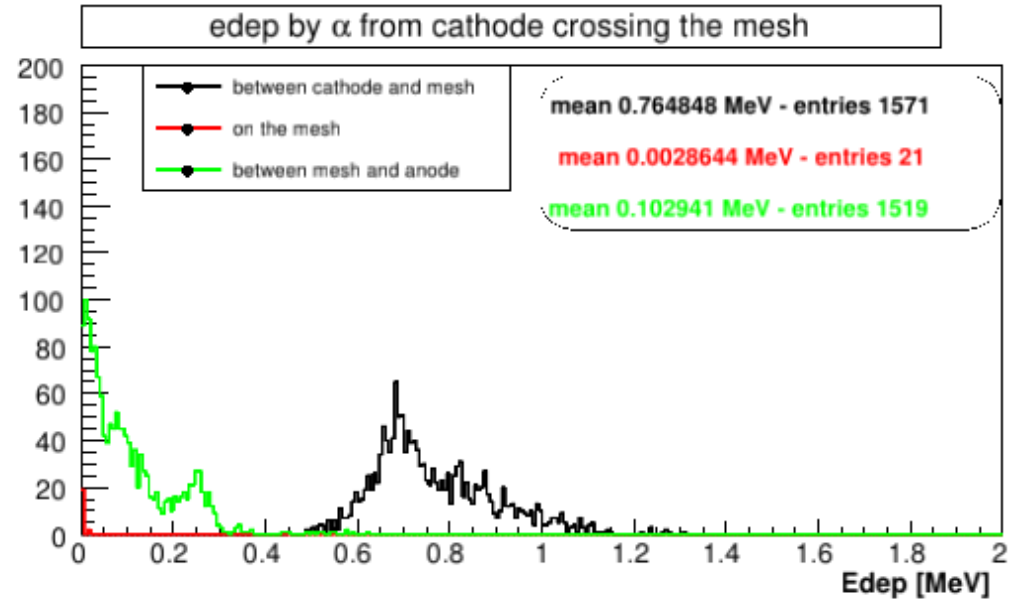
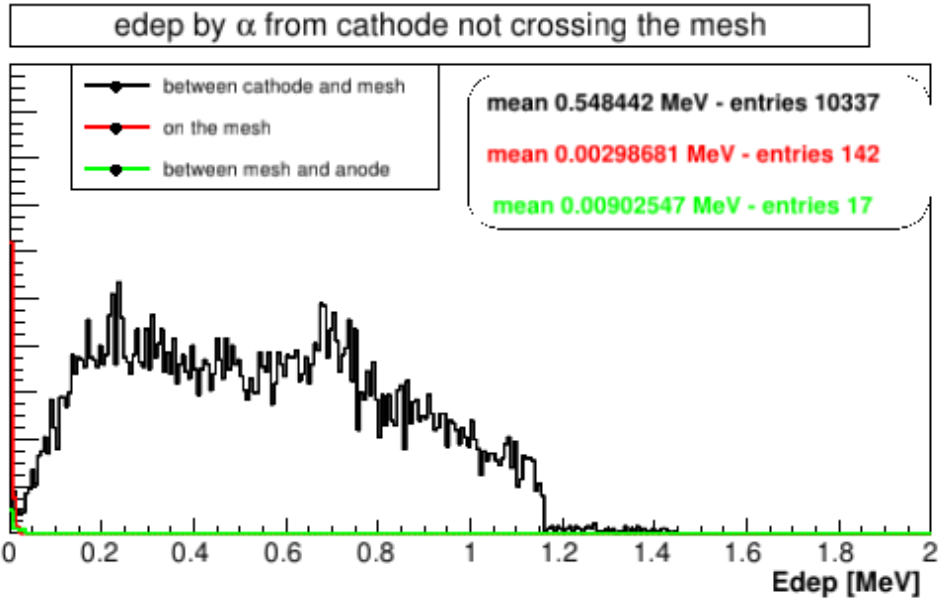
4- α from mesh backward

$$i_4 = \Phi * \varepsilon_4 * N_{\text{ION},4} * G * S * T_{\text{ELE}}$$

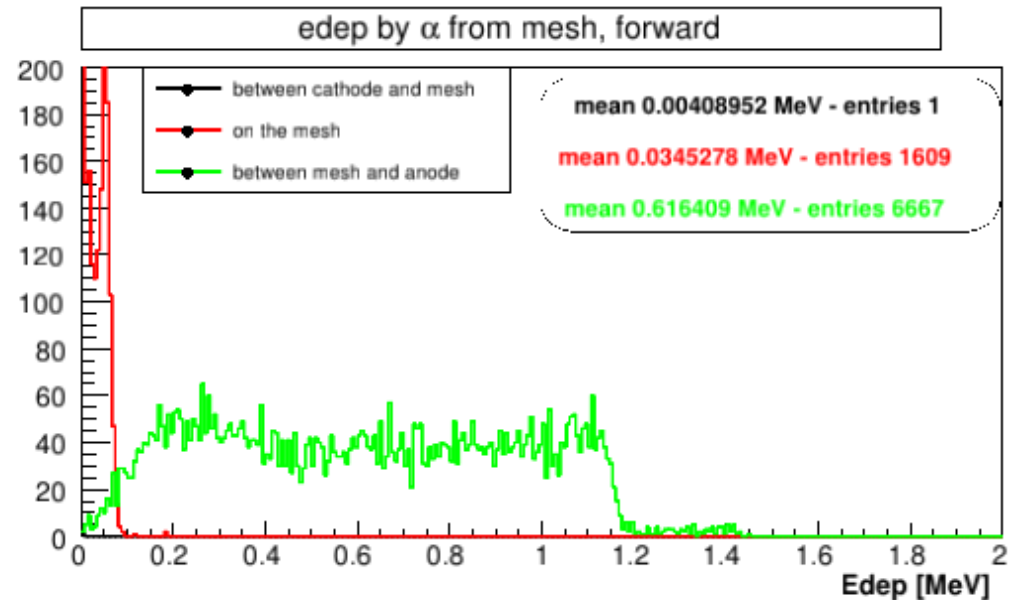
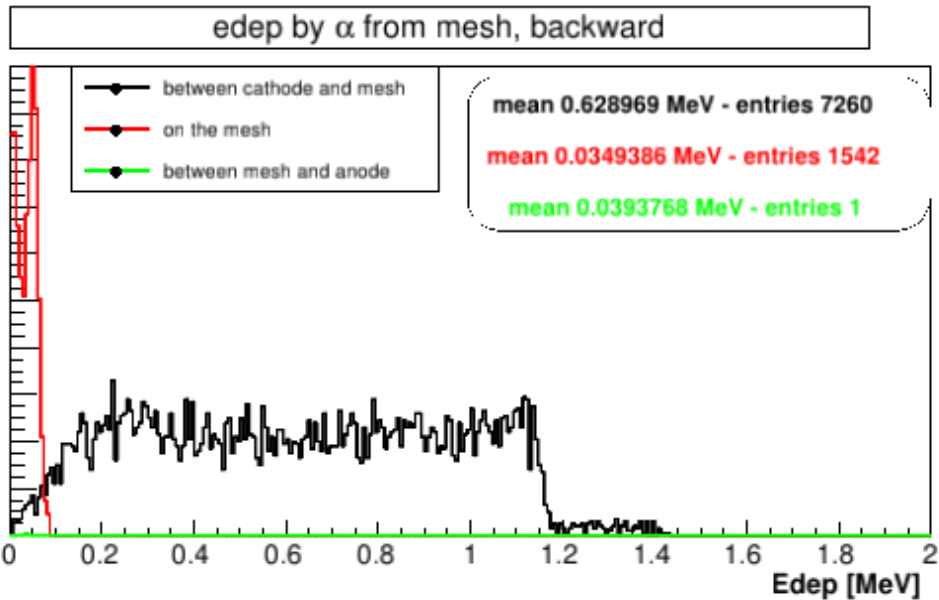
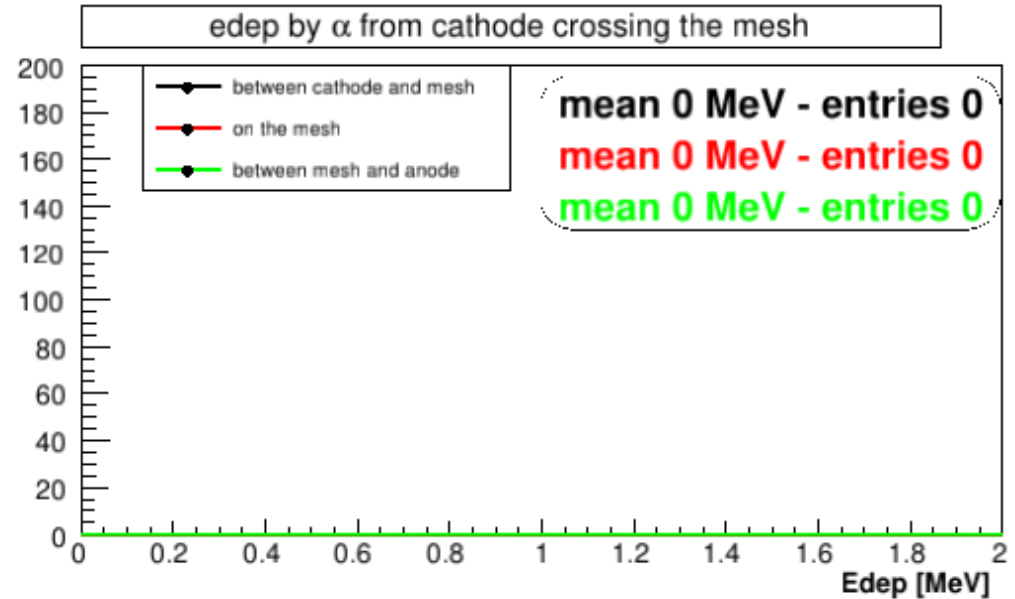
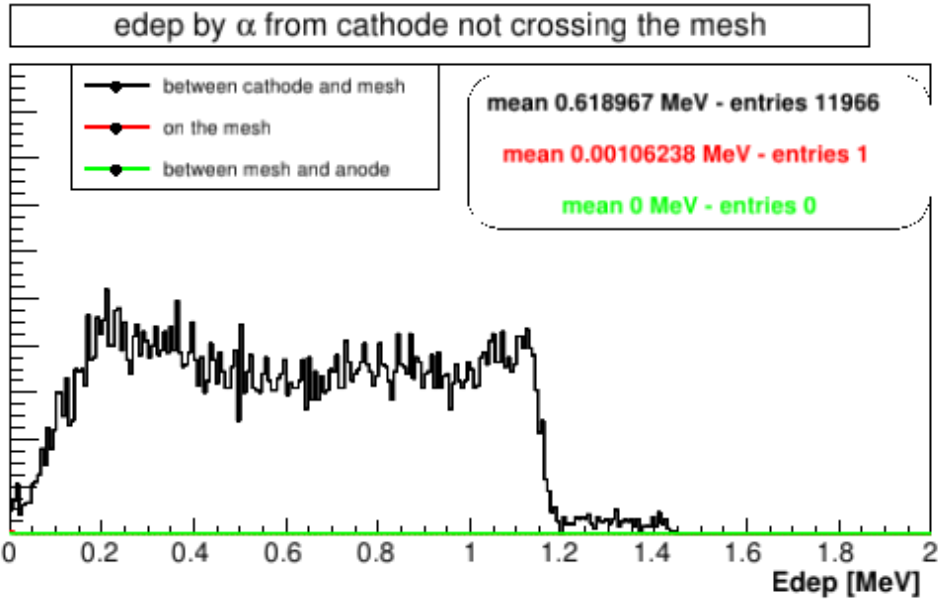
Edep #alpha – T=30% – 3+6



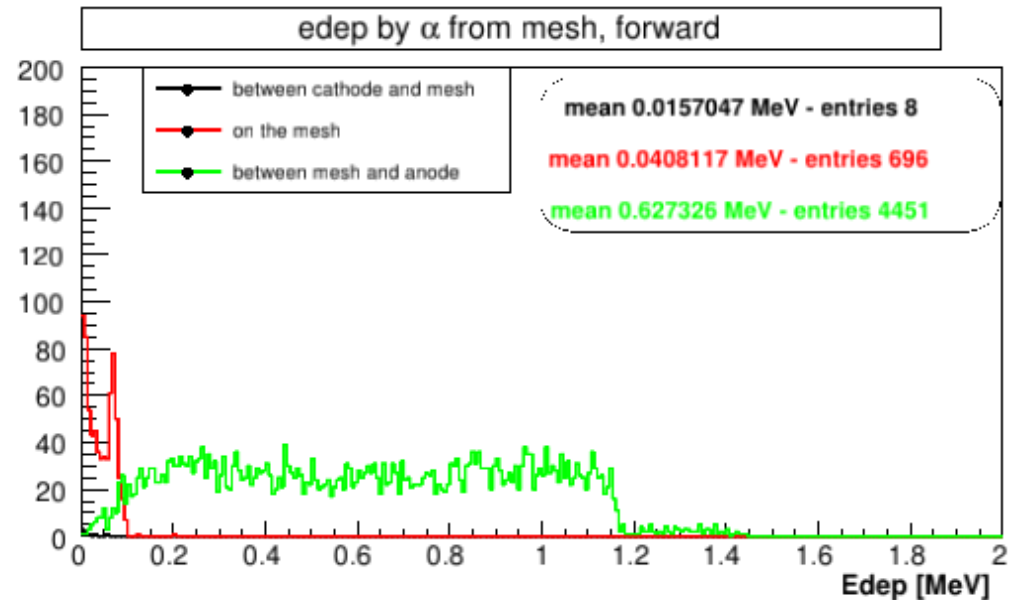
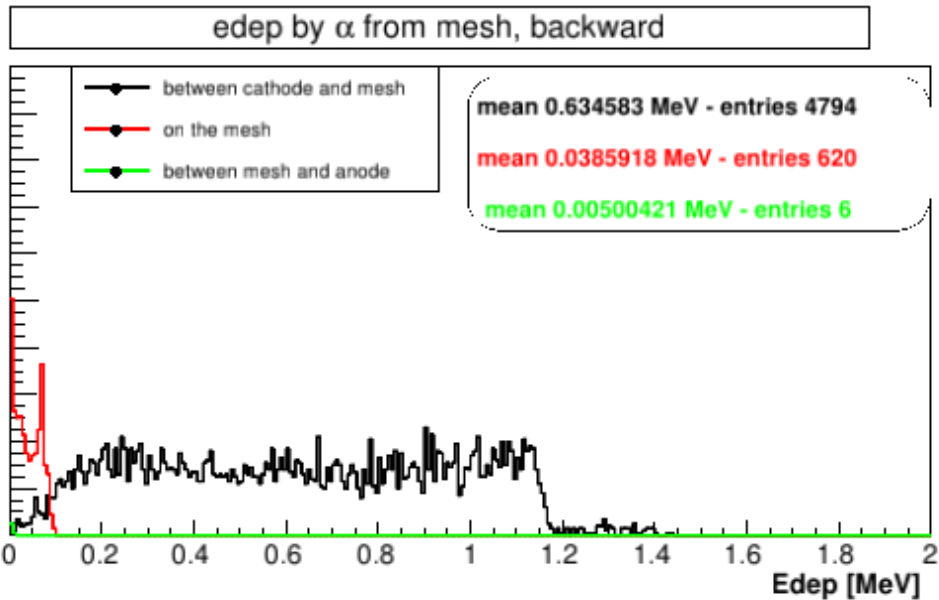
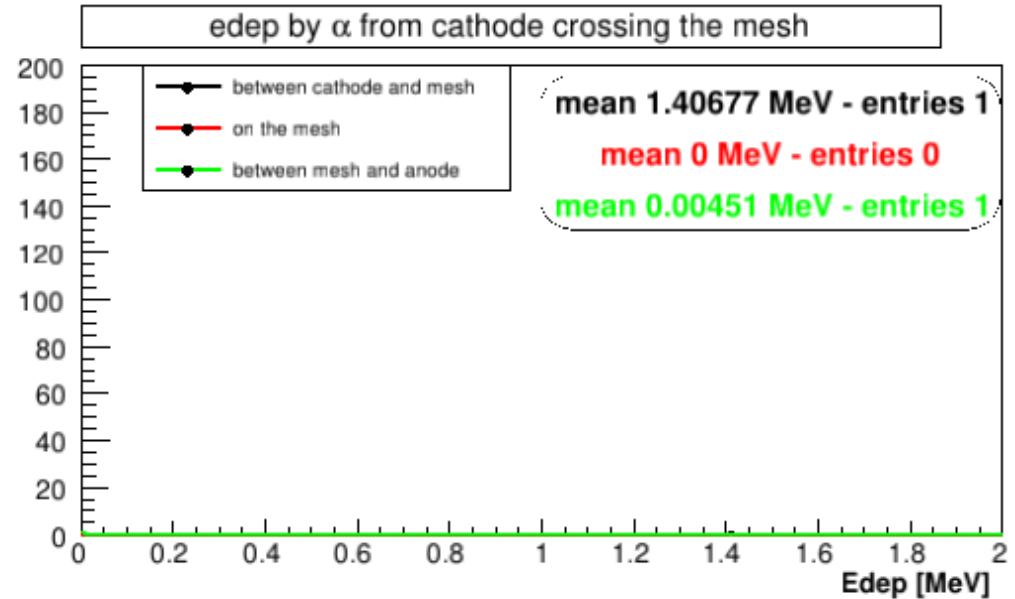
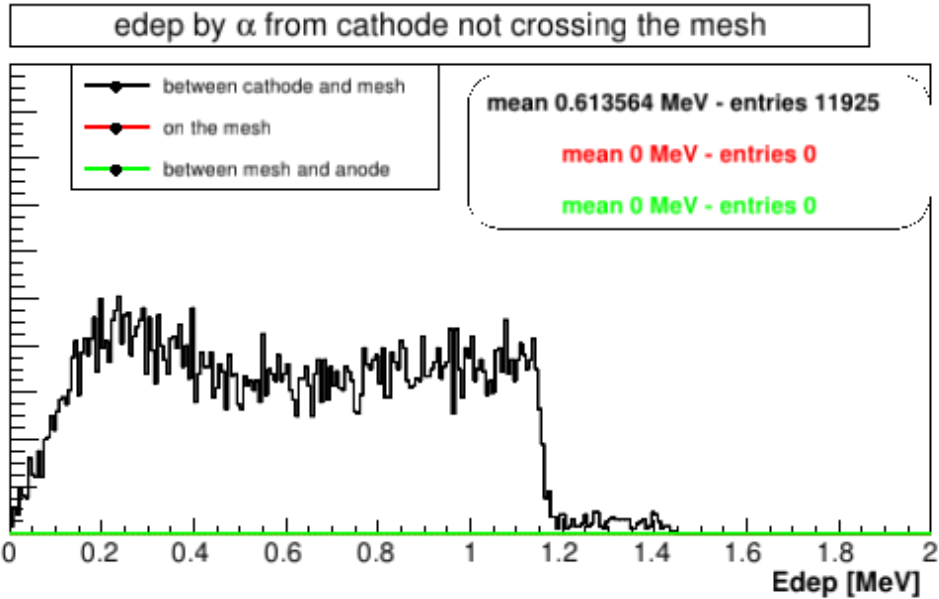
Edep #alpha – T=60% – 3+6



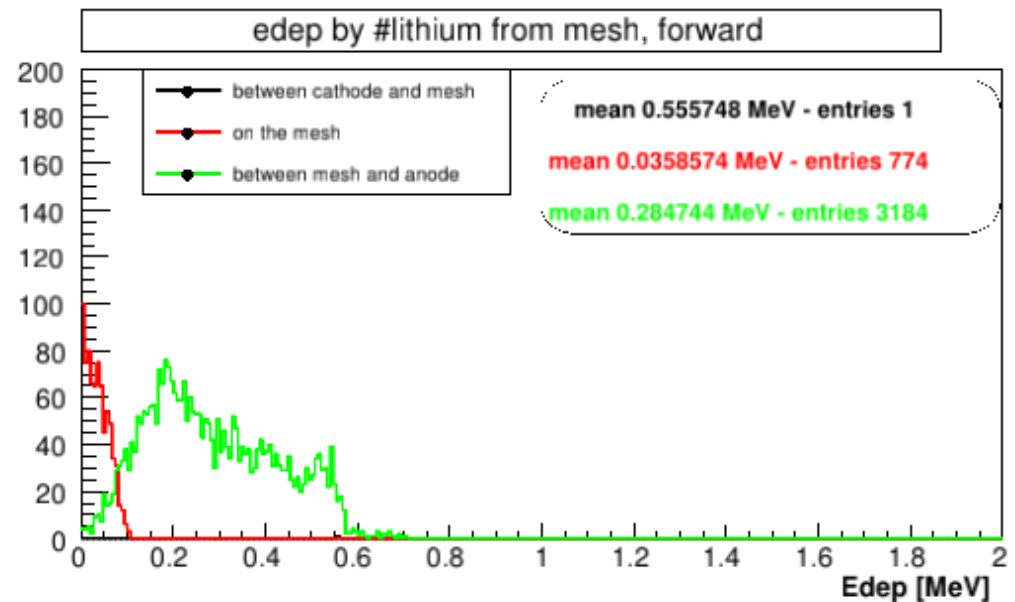
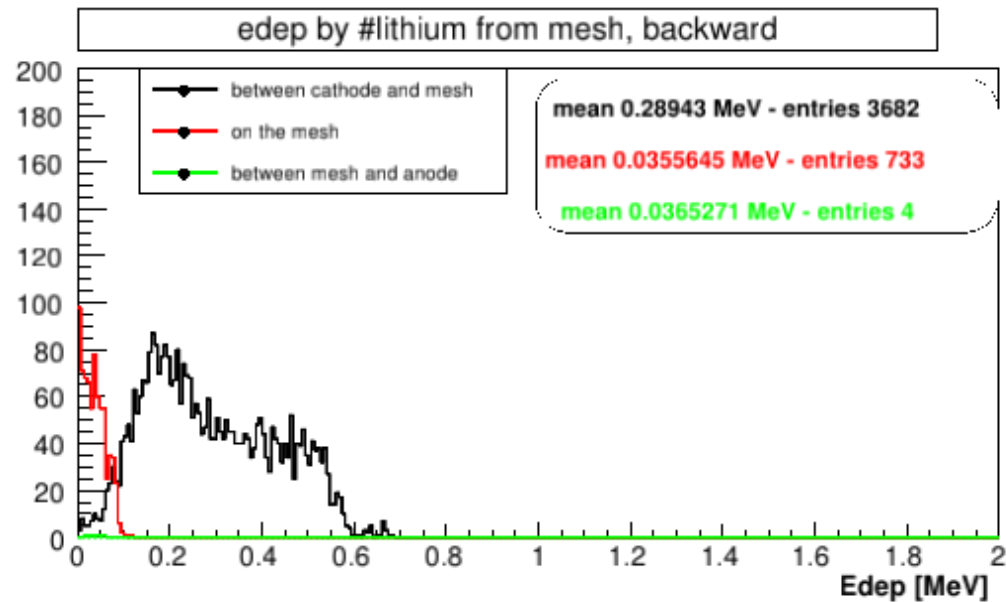
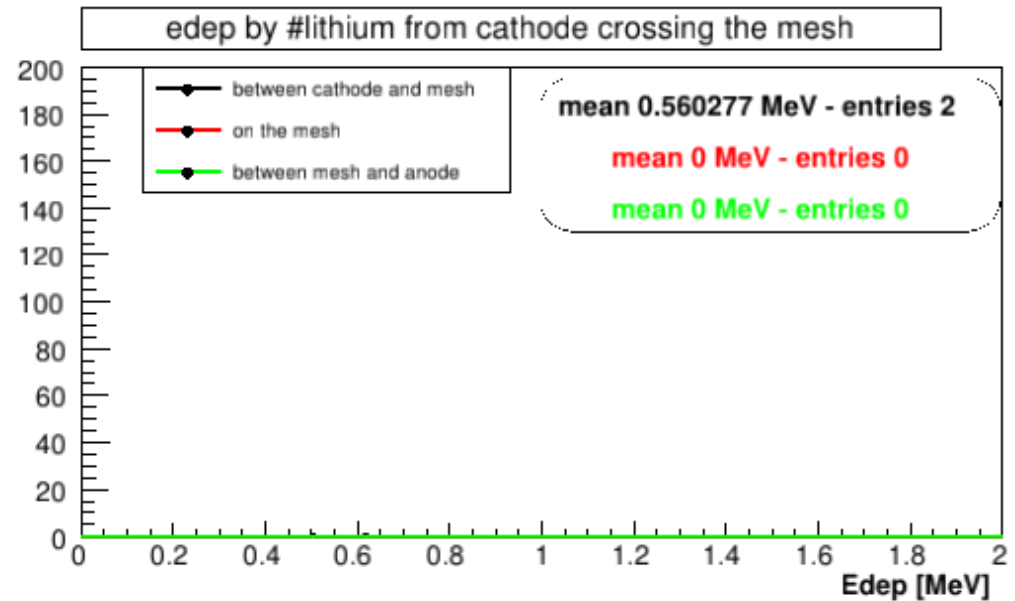
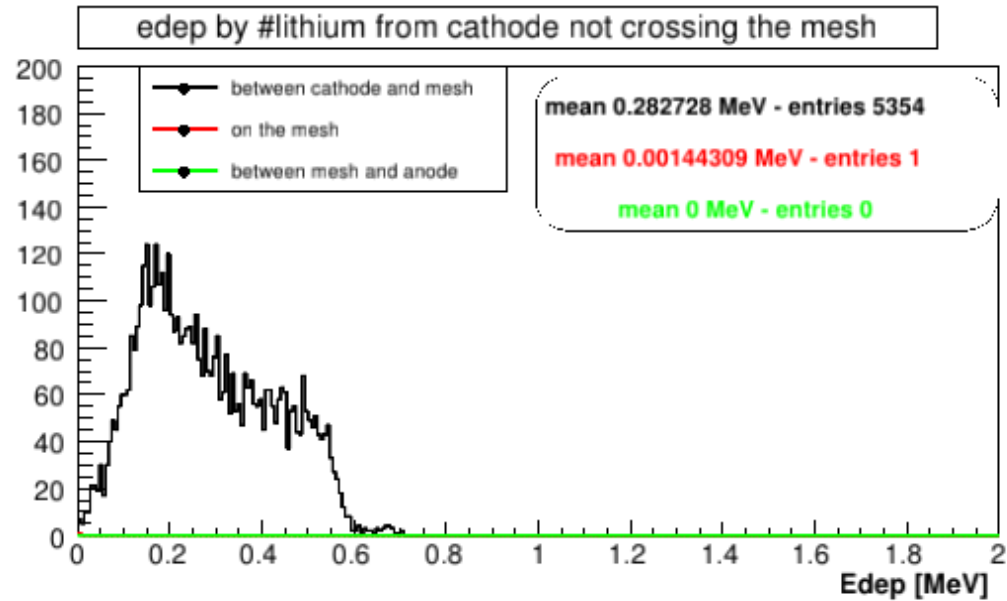
Edep #alpha – T=30% – 6+6



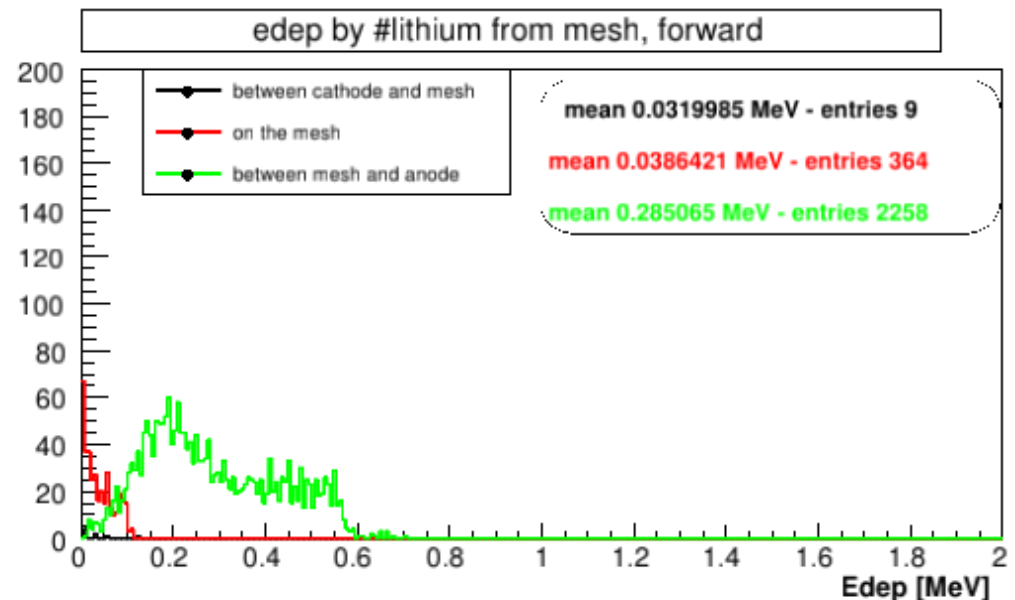
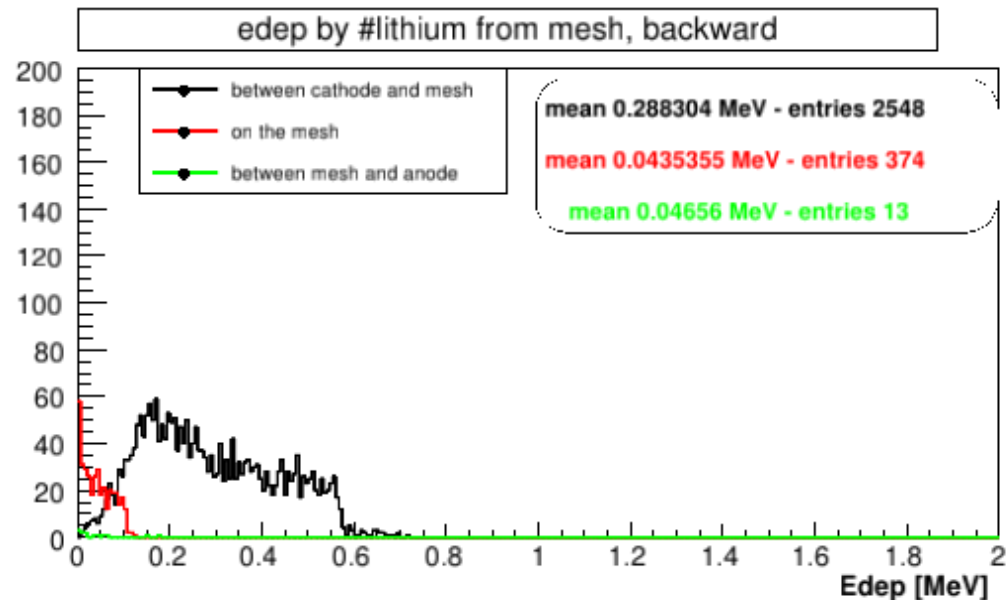
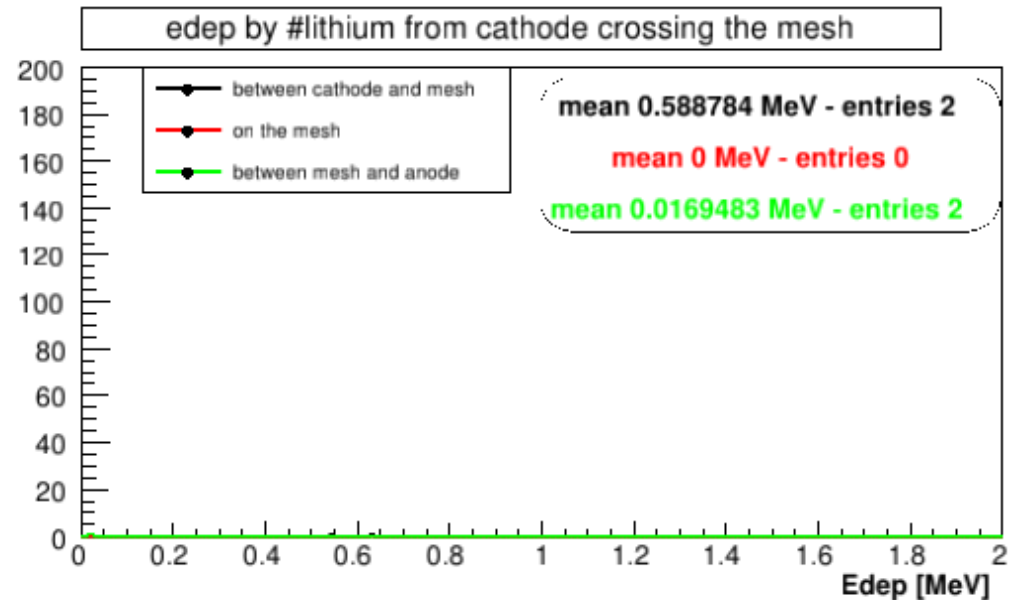
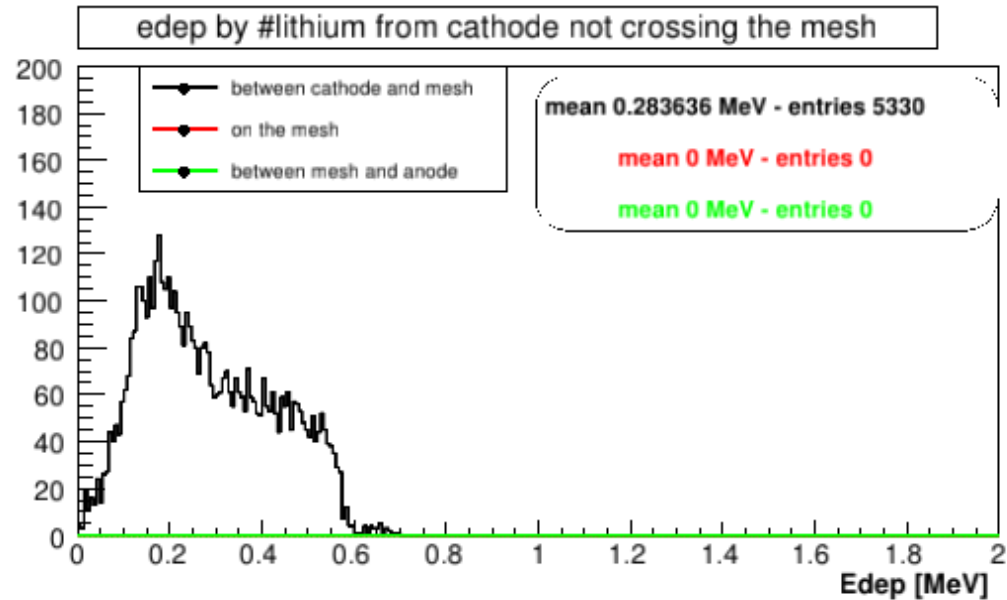
Edep #alpha – T=60% – 6+6



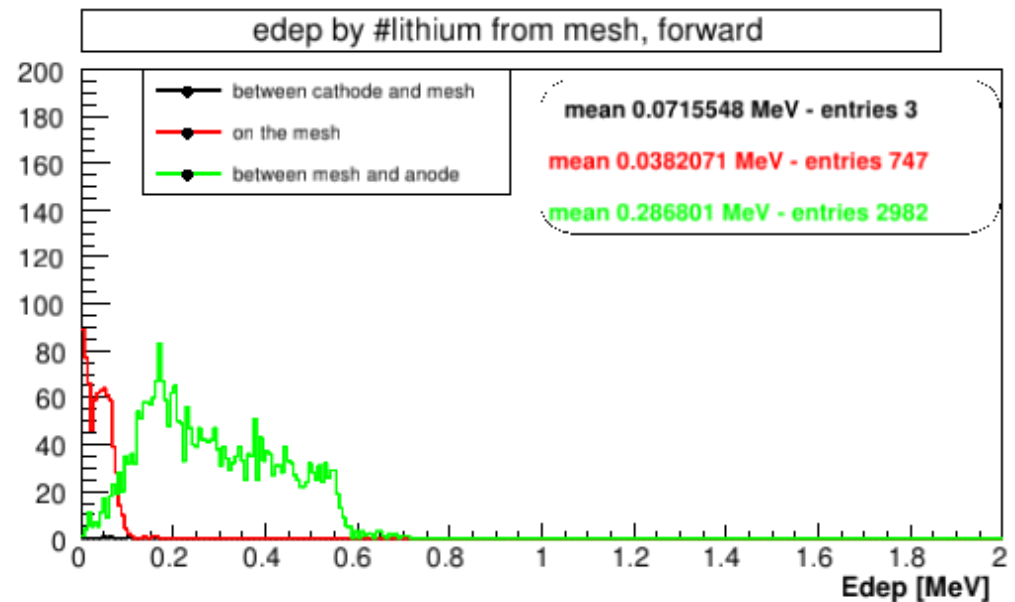
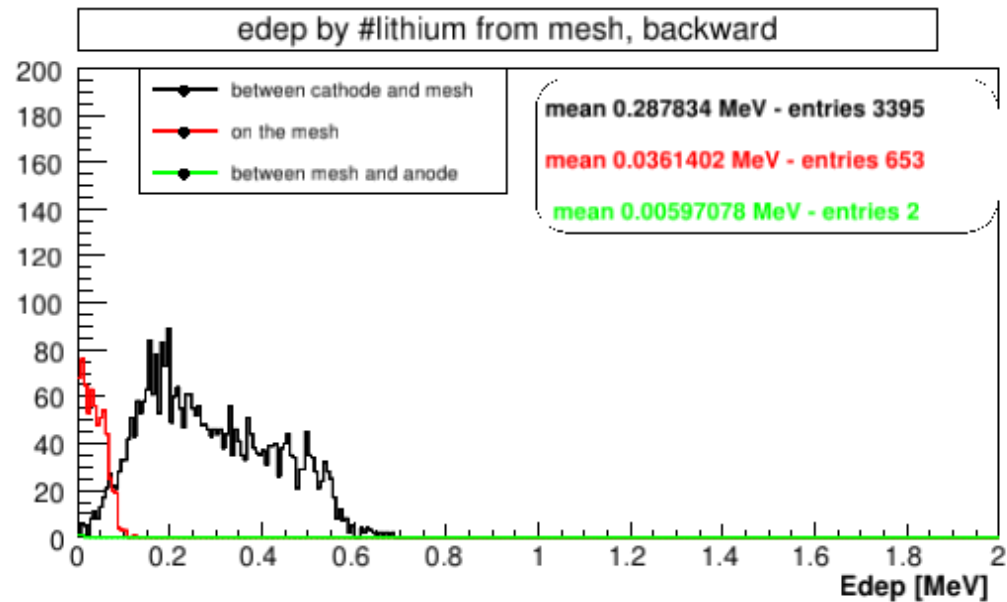
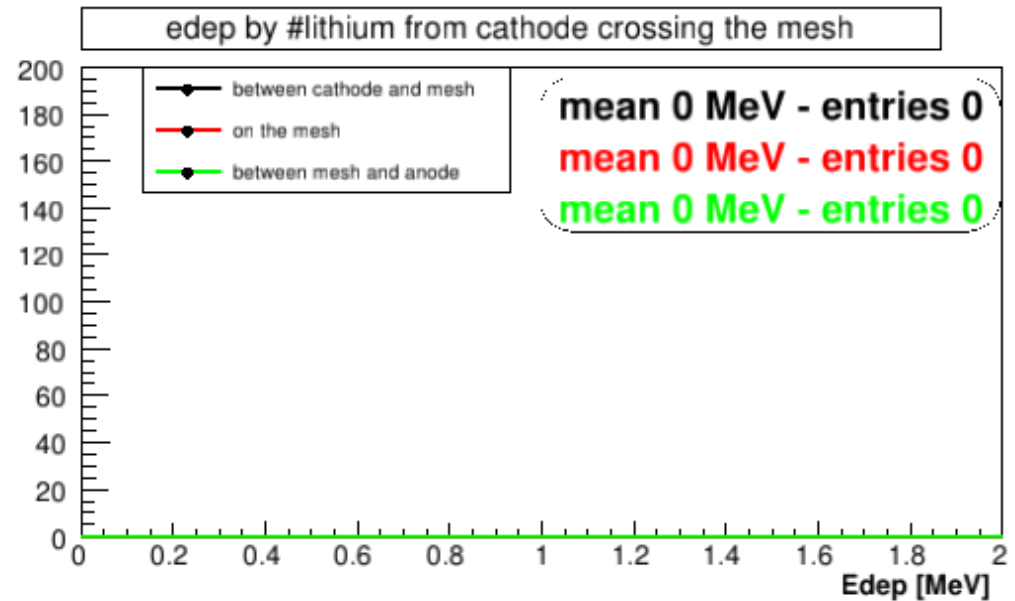
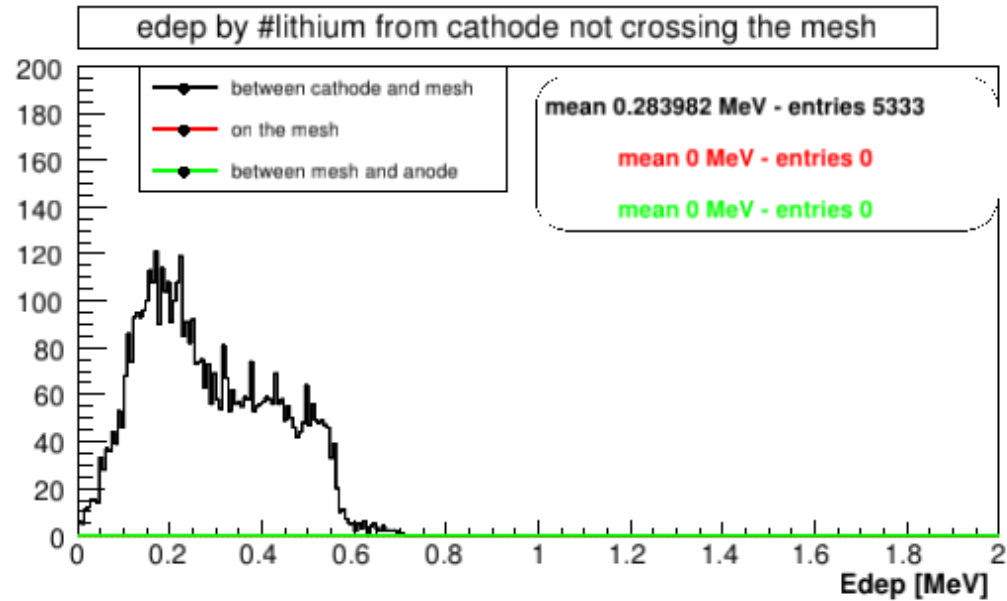
Edep #lithium – T=30% – 3+6



Edep #lithium – T=60% – 3+6



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Edep #lithium – T=60% – 6+6

