Simulation Update
STAR Calorimeter
Total E_dep Histograms

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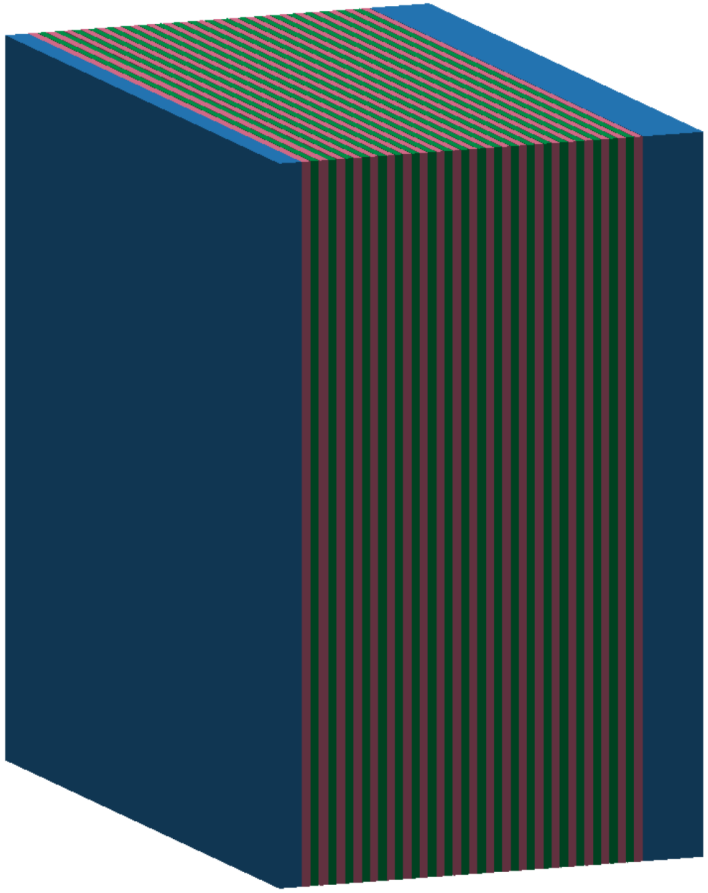
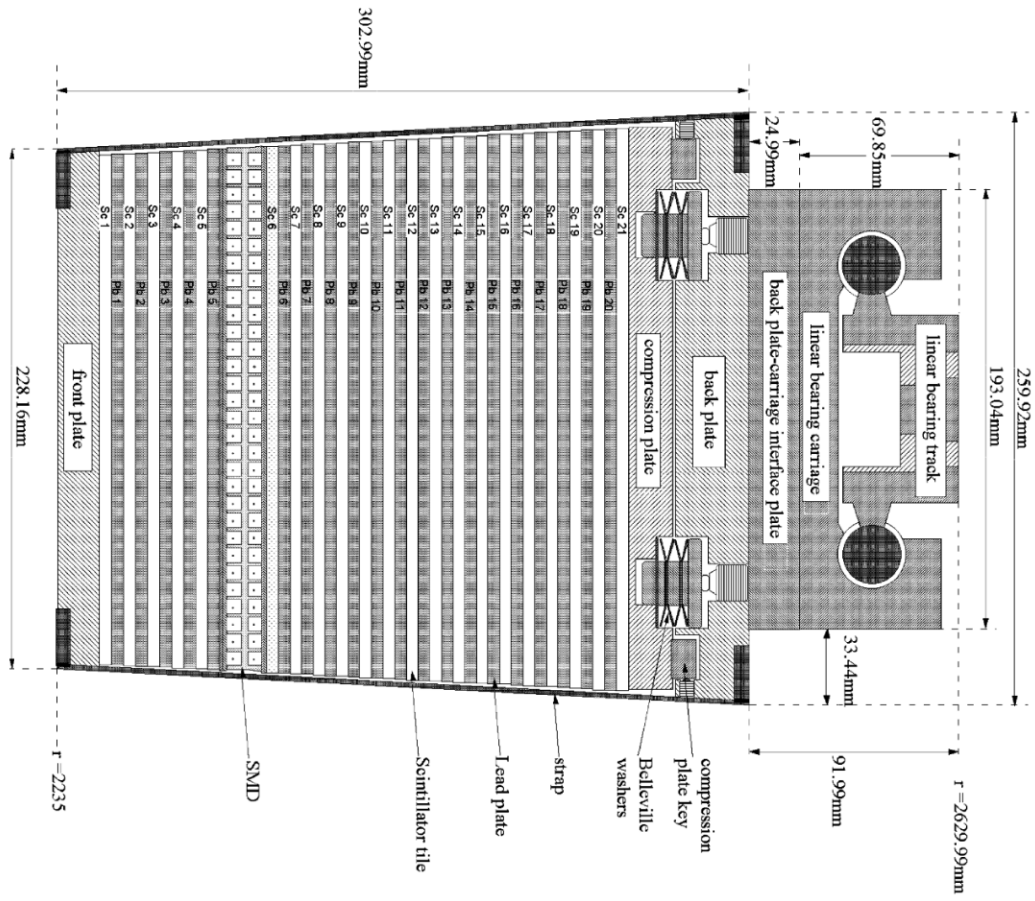
Process

- Included secondaries
- Focused on 3 particle beams at various kinetic energies:
  - Proton
  - Neutron
  - Electron
- Kinetic Energies tested (in MeV):
  - 50, 100, 300, 500, 1000, 2000
- Beam position: (0,0,-10 cm)
- Beam Energy: [mass of particle] + [KE]
- E_dep is the deposition **just in** the scintillator

Simulation Setup

Incident Particle

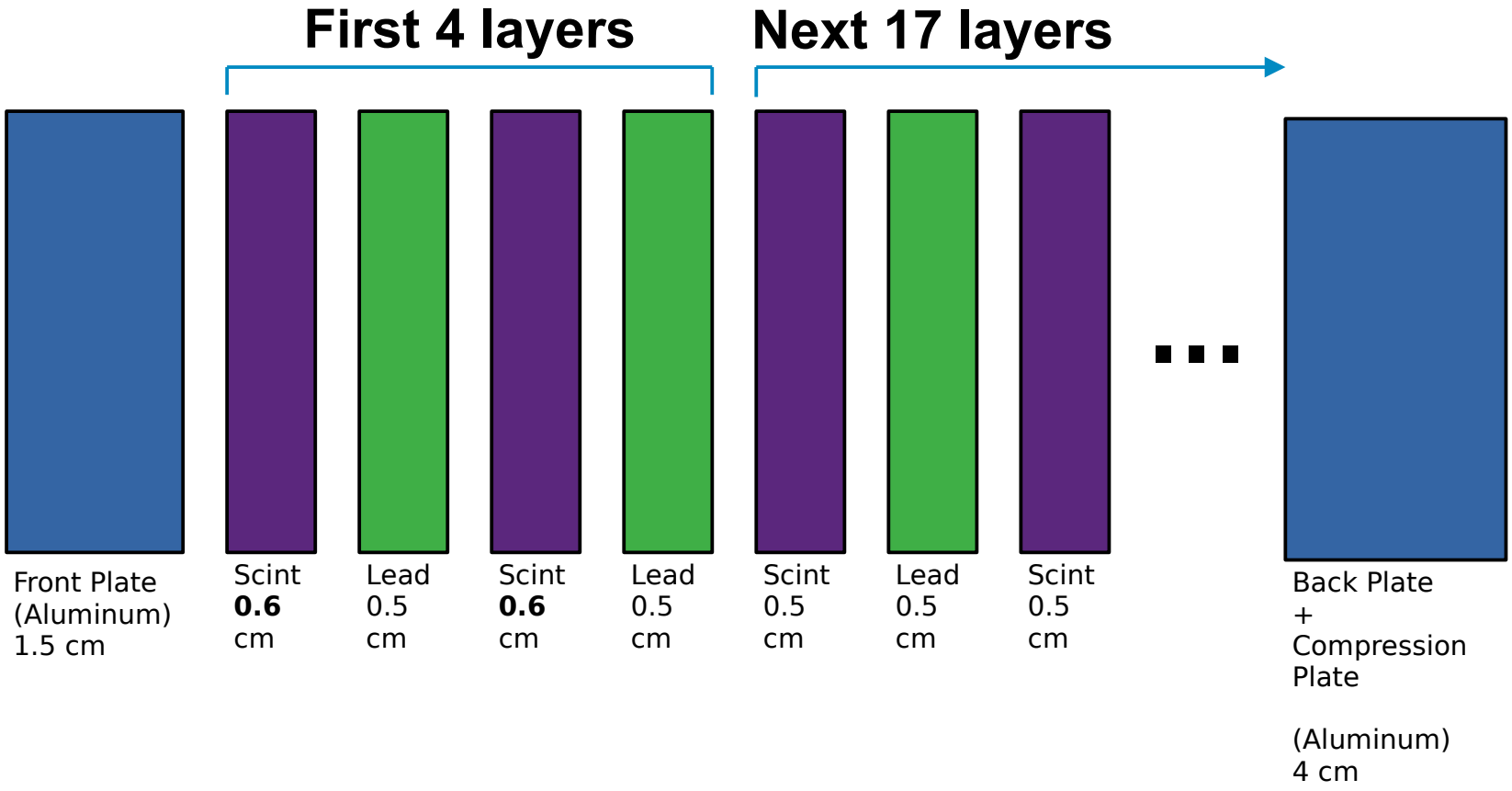




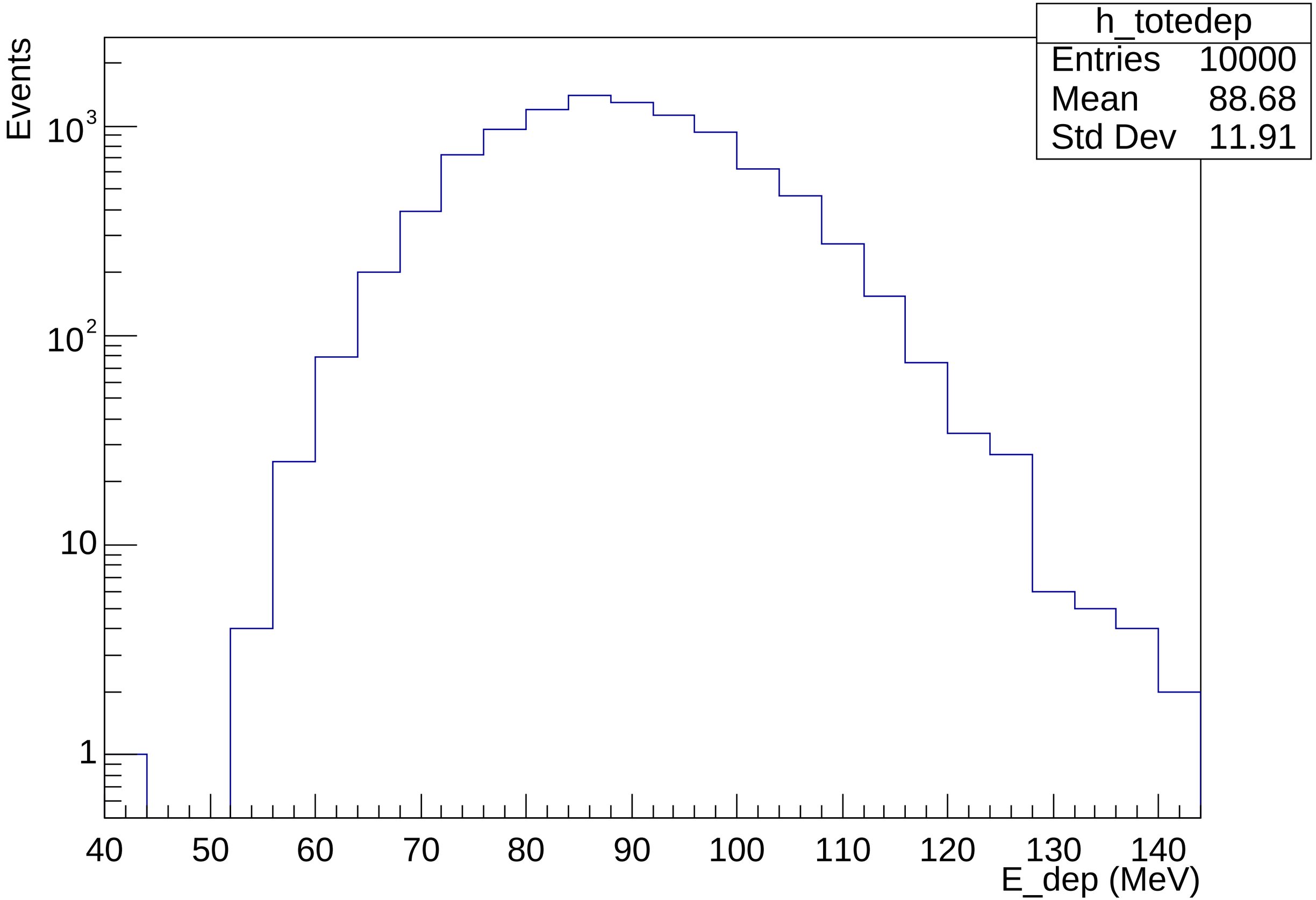
Simulation Setup (Cont.)

Neutrons
or
Protons
or
Electrons

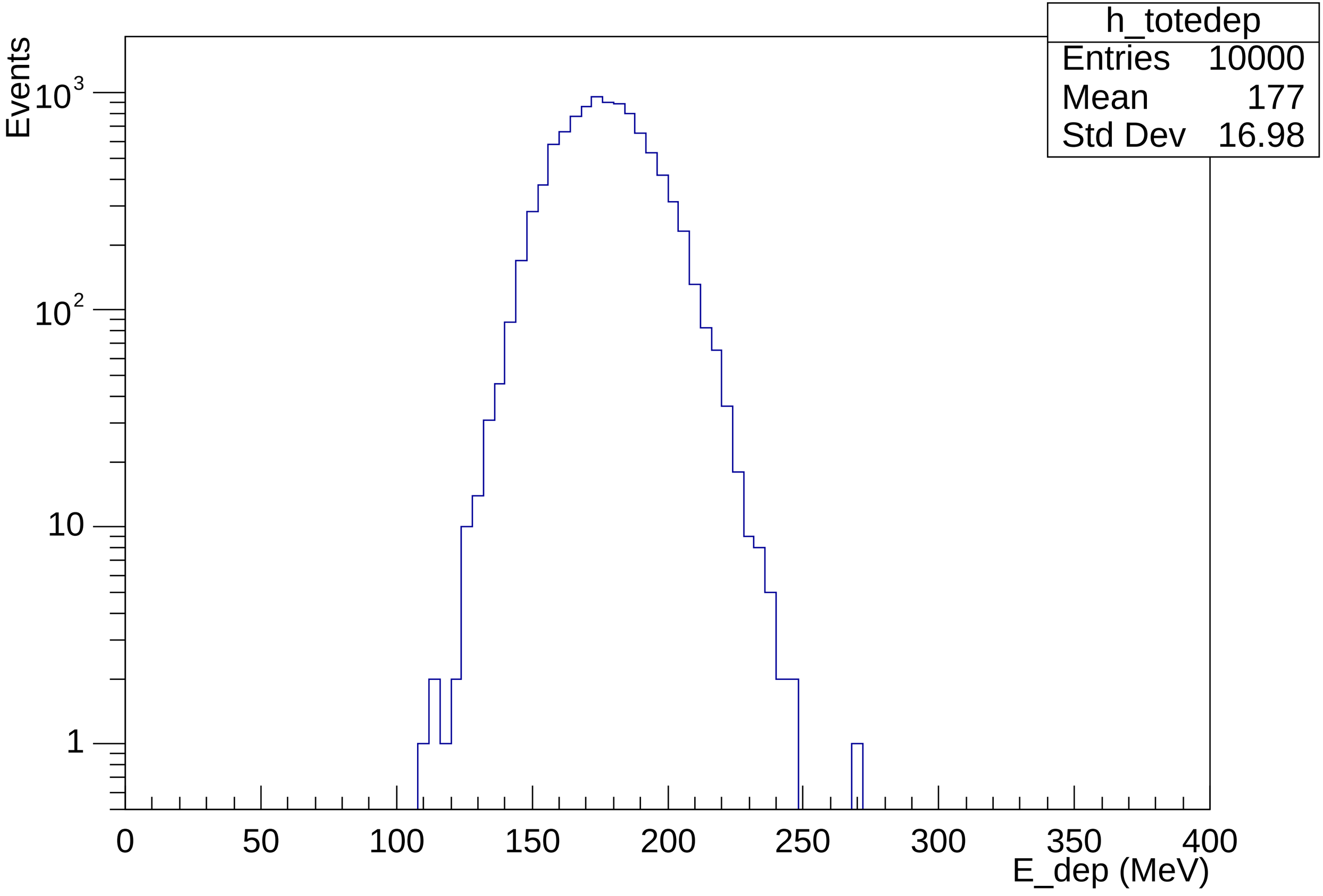
At KE (MeV):
50
100
300
500
1000
2000



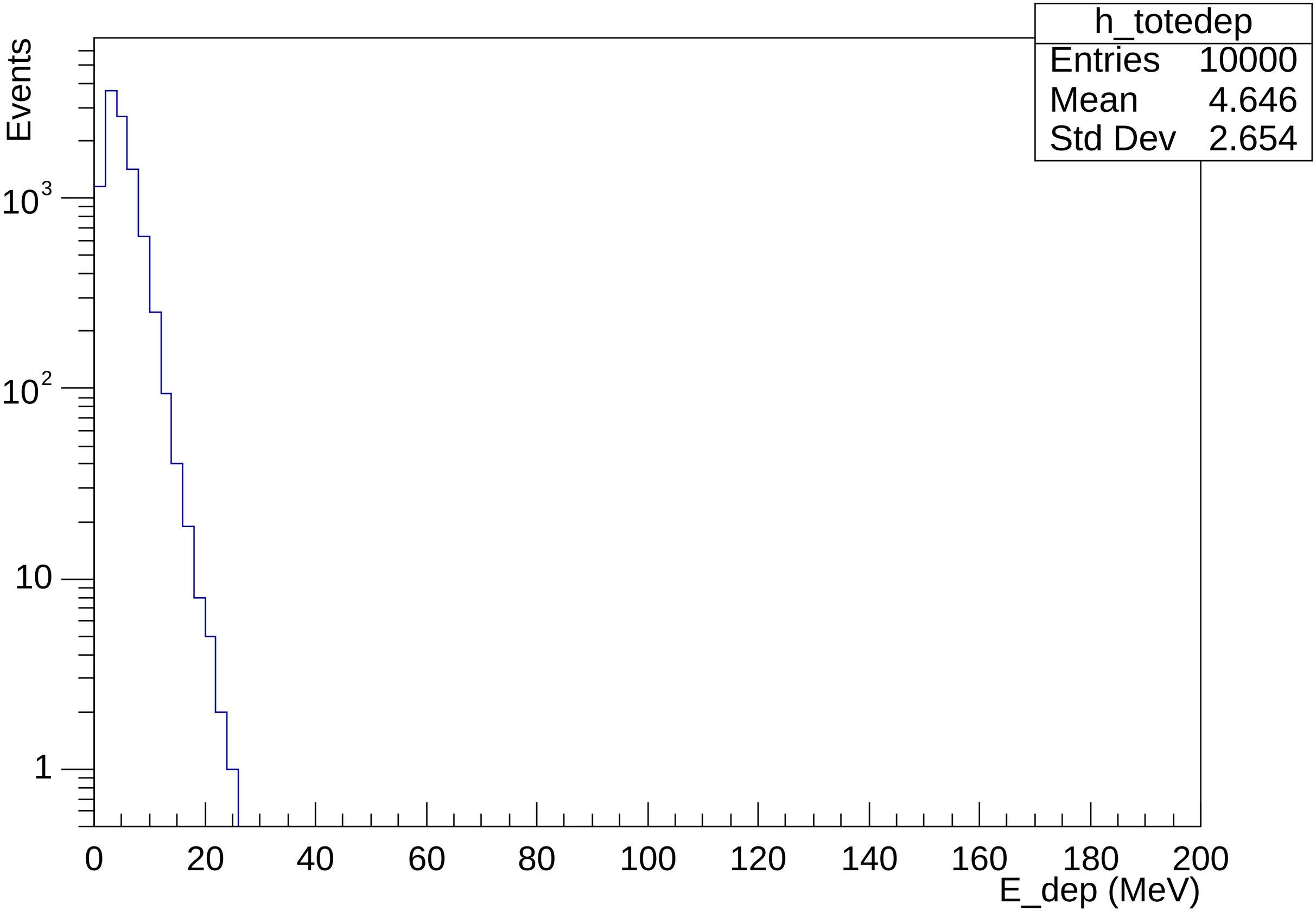
Total electron E_dep - e1gev KE



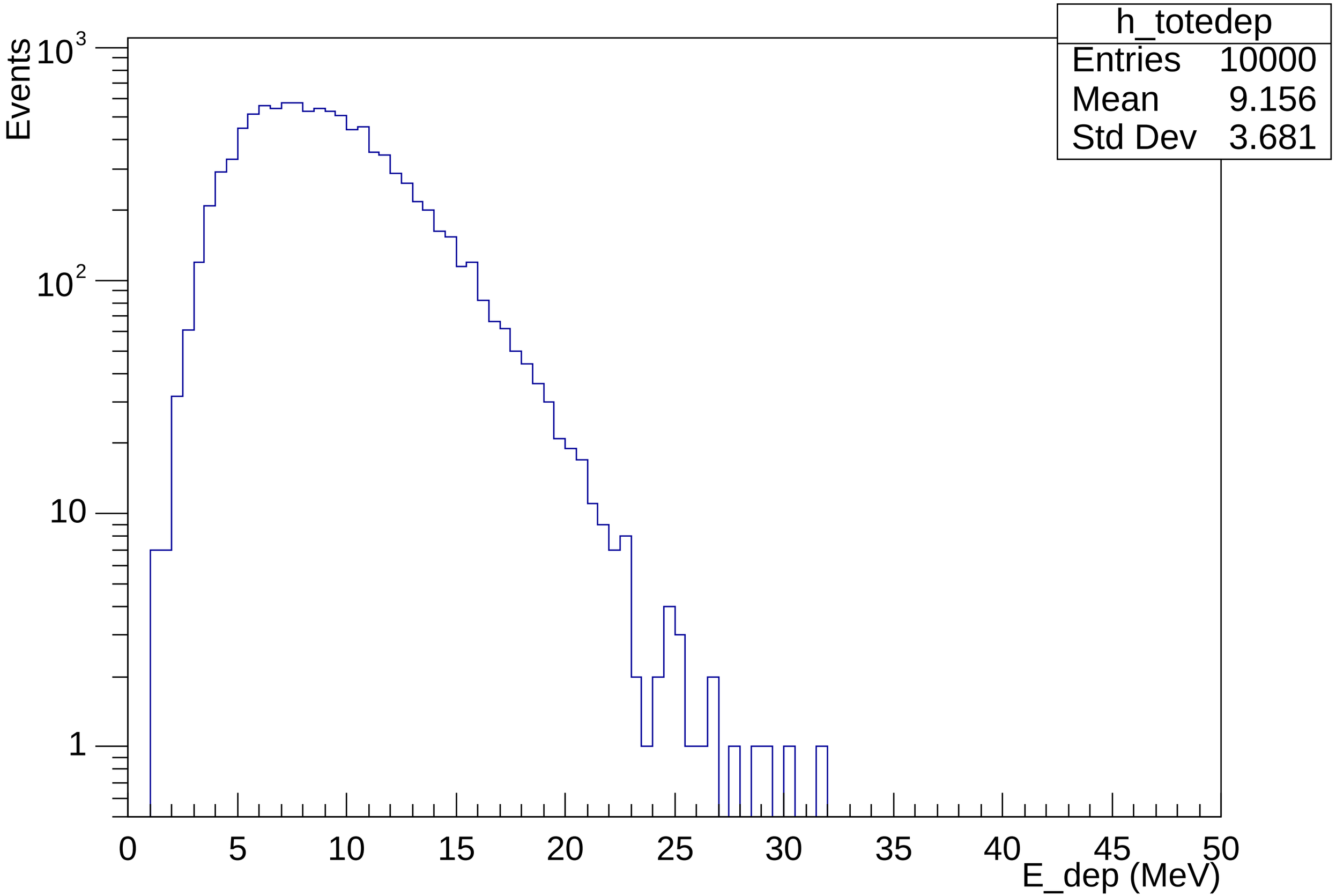
Total electron E_dep - e2gev KE



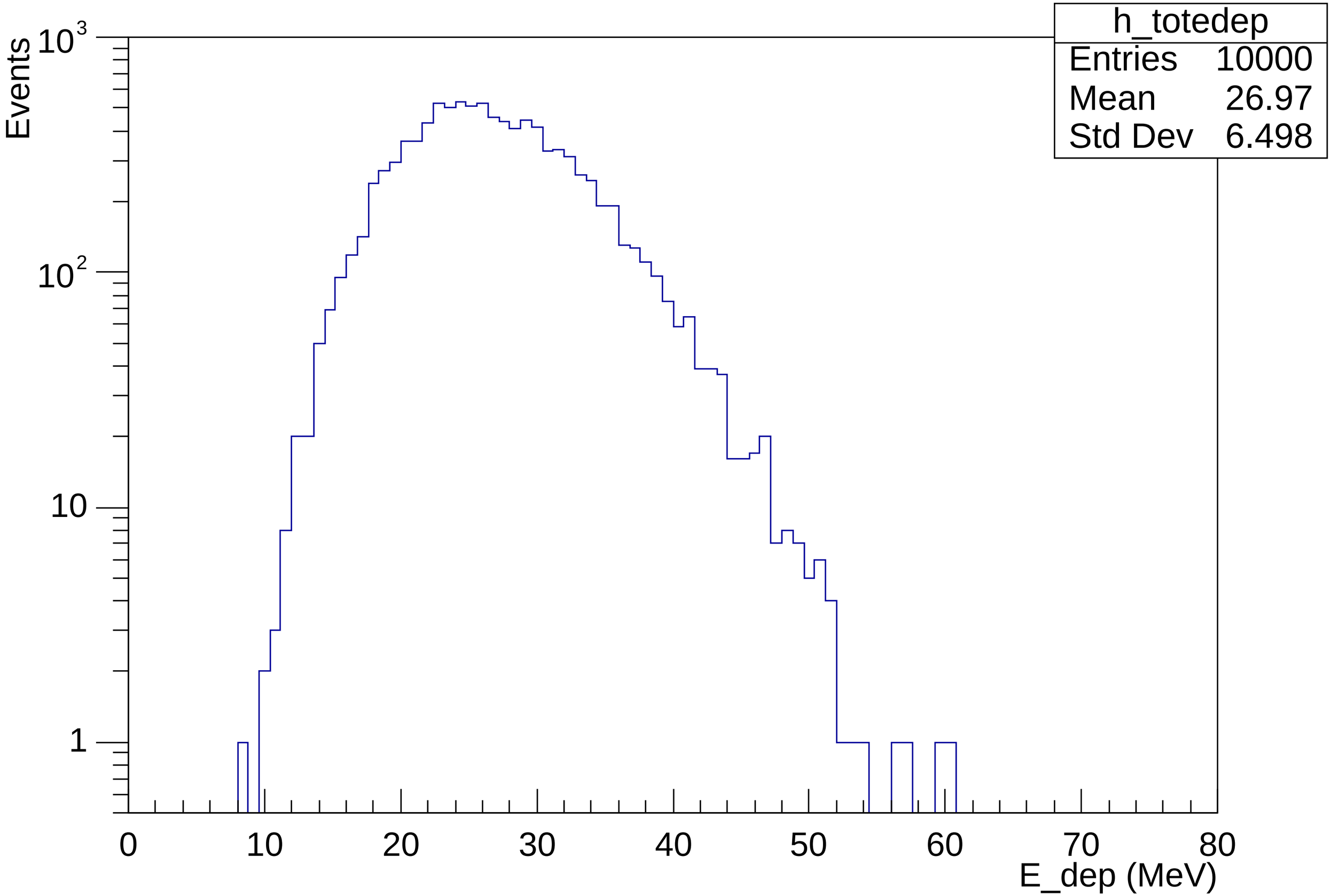
Total electron E_dep - e50 KE



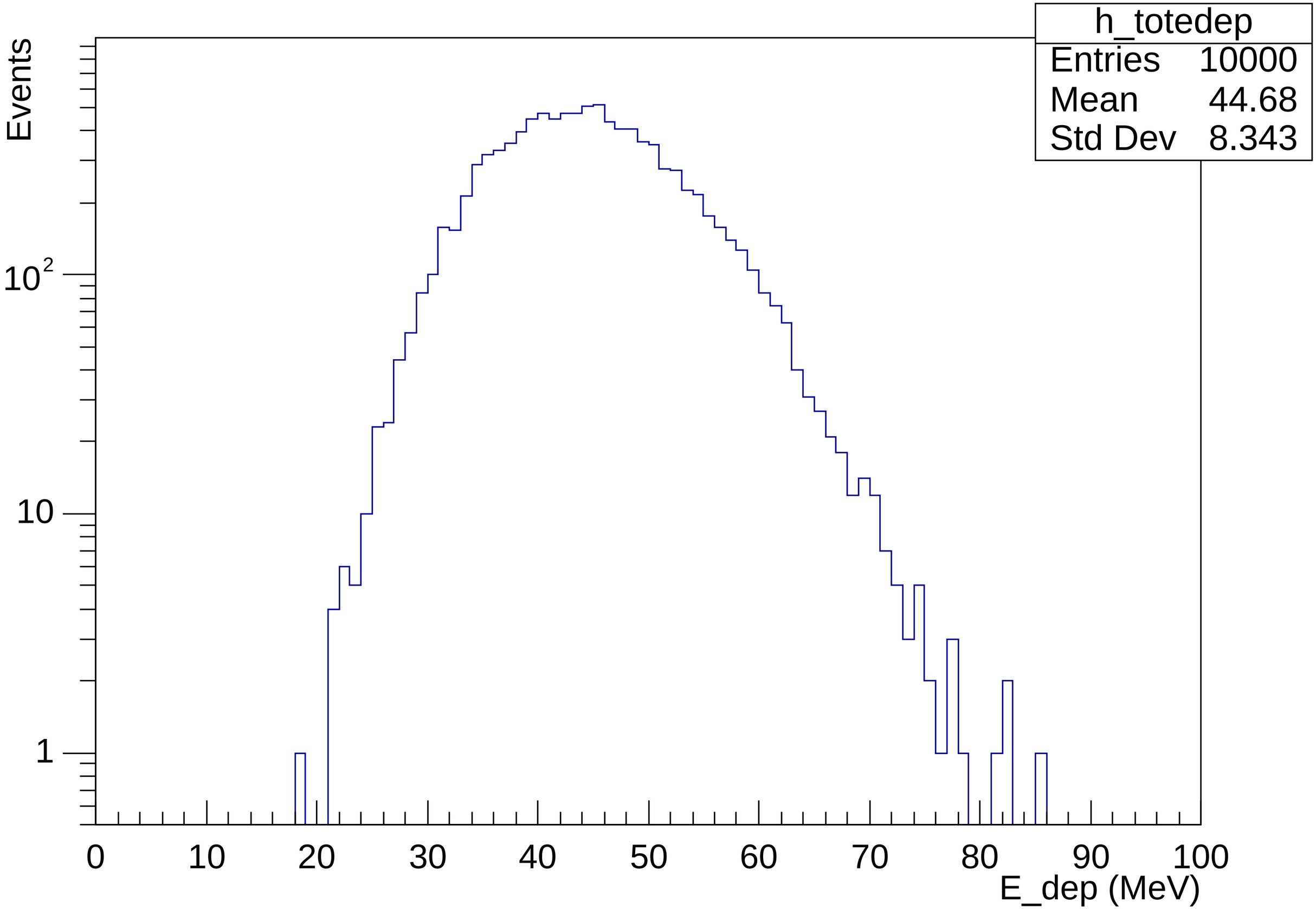
Total electron E_dep - e100 KE



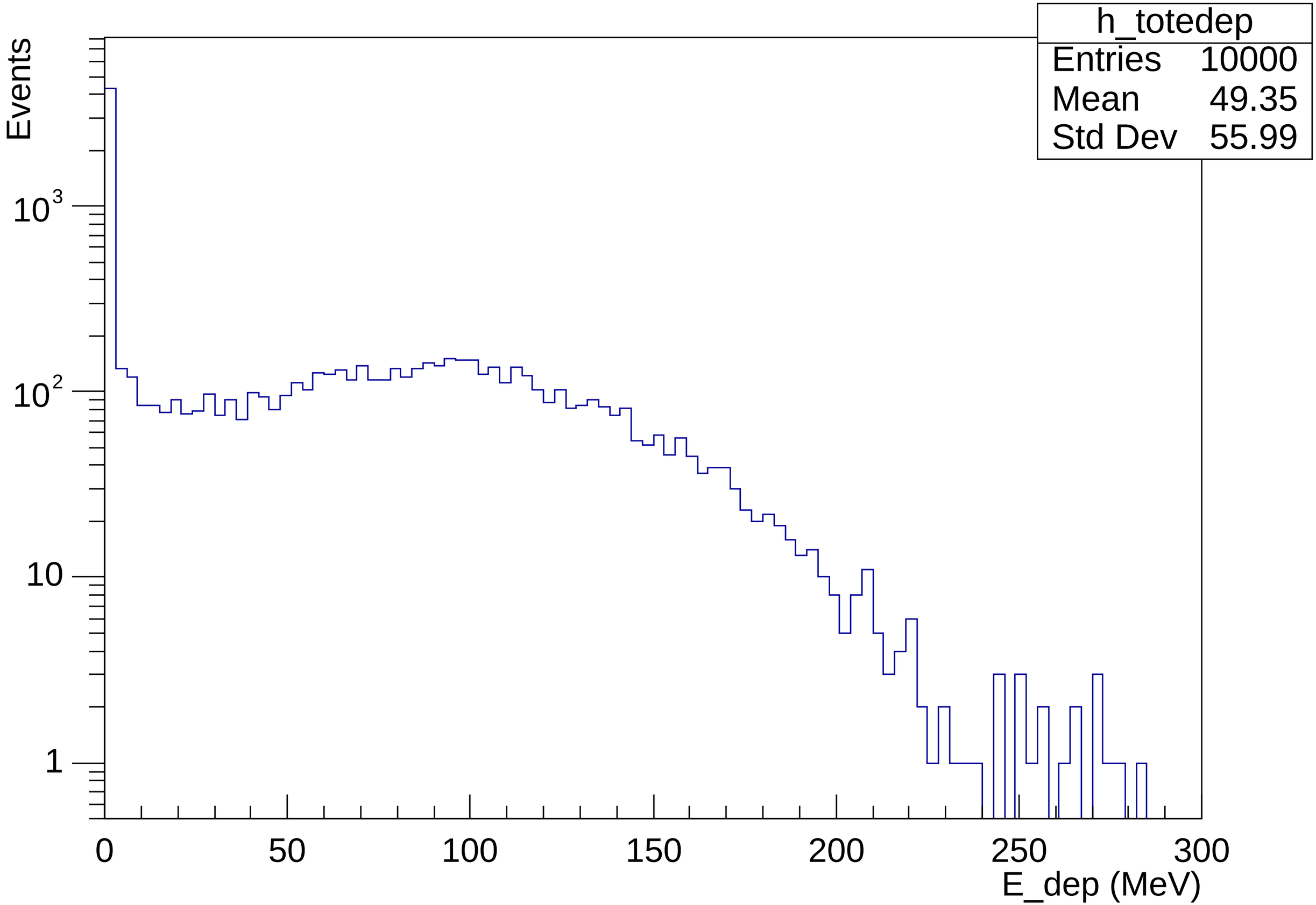
Total electron E_dep - e300 KE



Total electron E_dep - e500 KE



Total neutron E_dep - n1gev KE



Total neutron E_dep - n2gev KE

h_totedep	
Entries	10000
Mean	78.44
Std Dev	87.63

Events

10^3

10^2

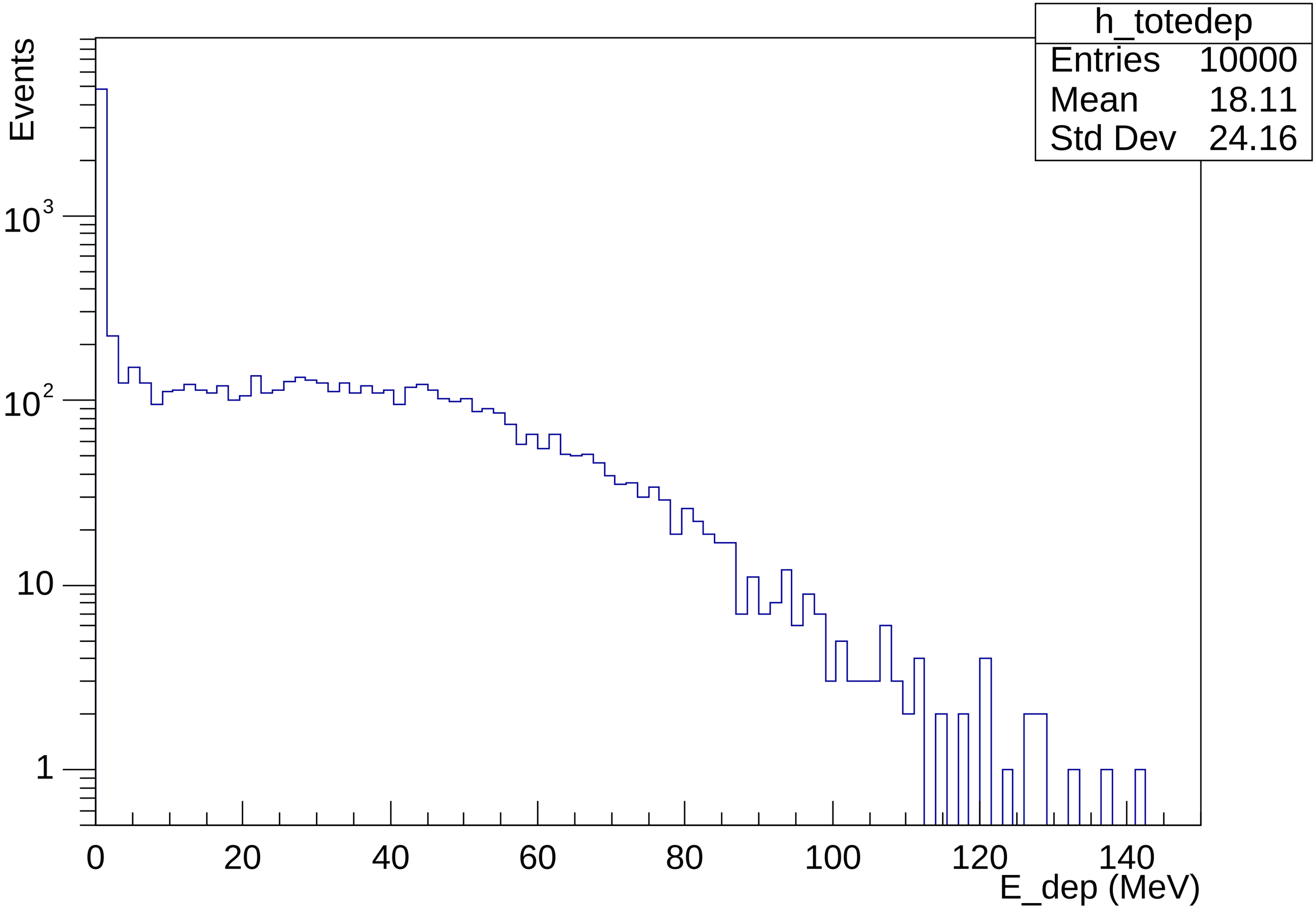
10

1

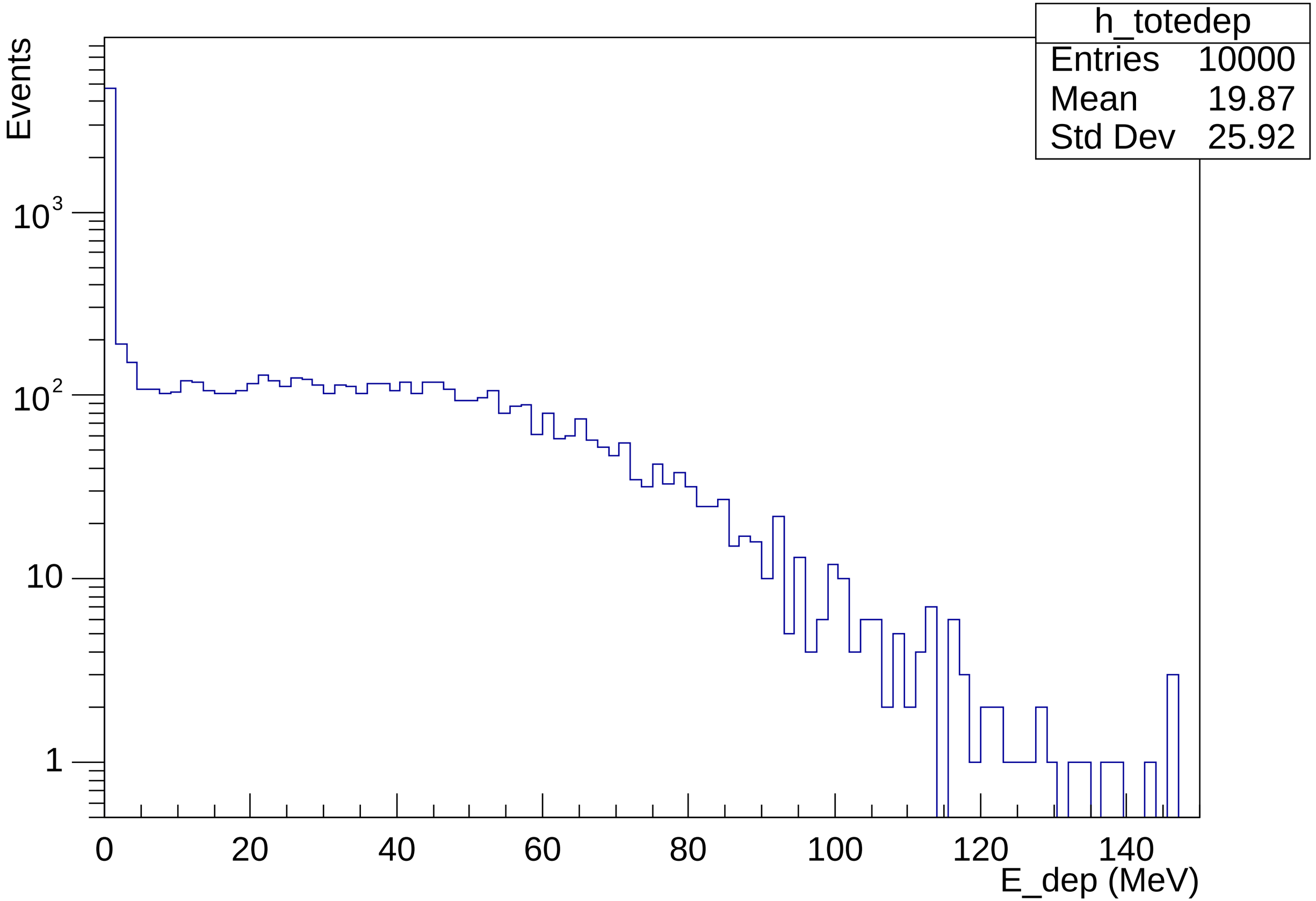
0 50 100 150 200 250 300 350 400

E_dep (MeV)

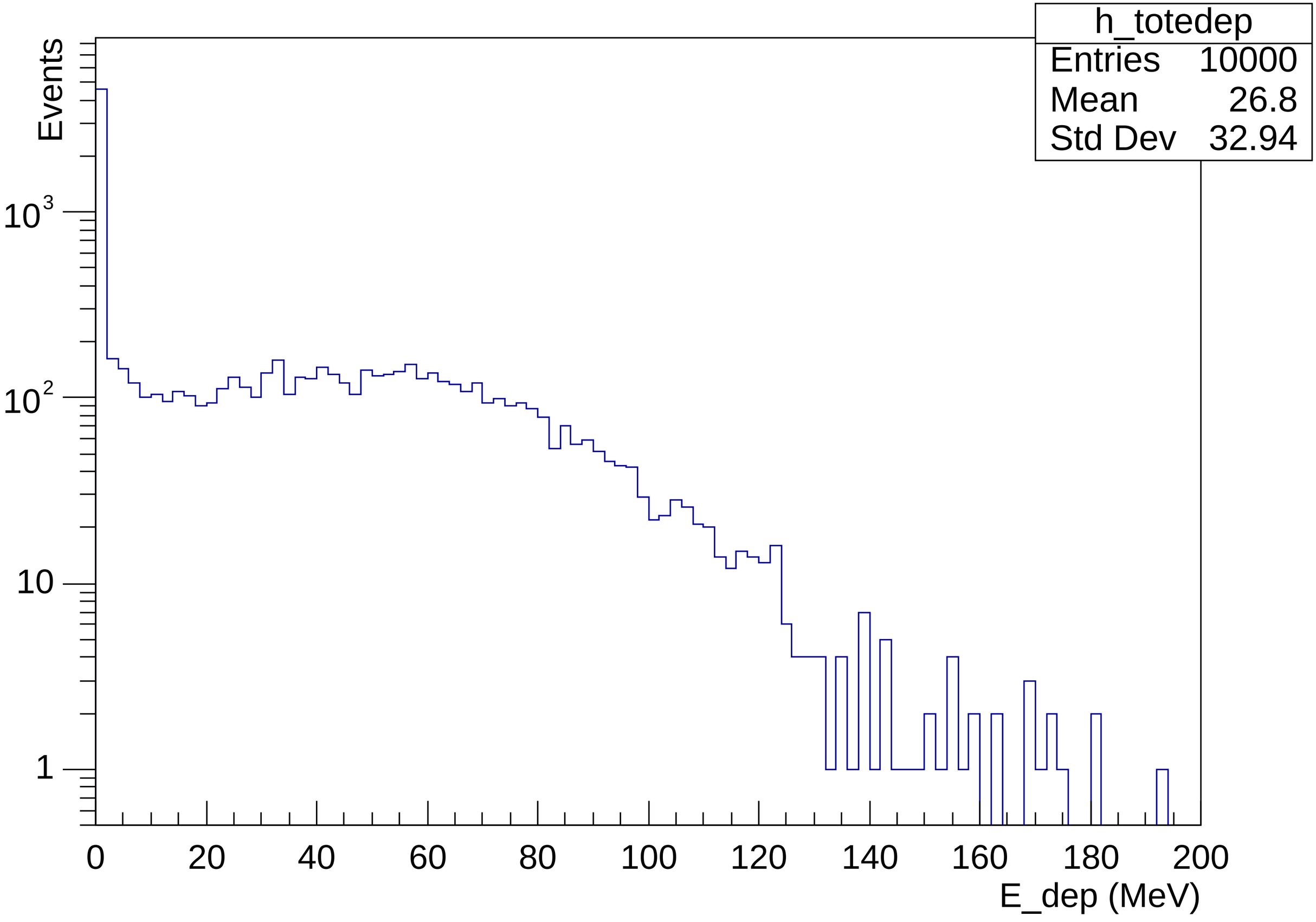
Total neutron E_dep - n50 KE



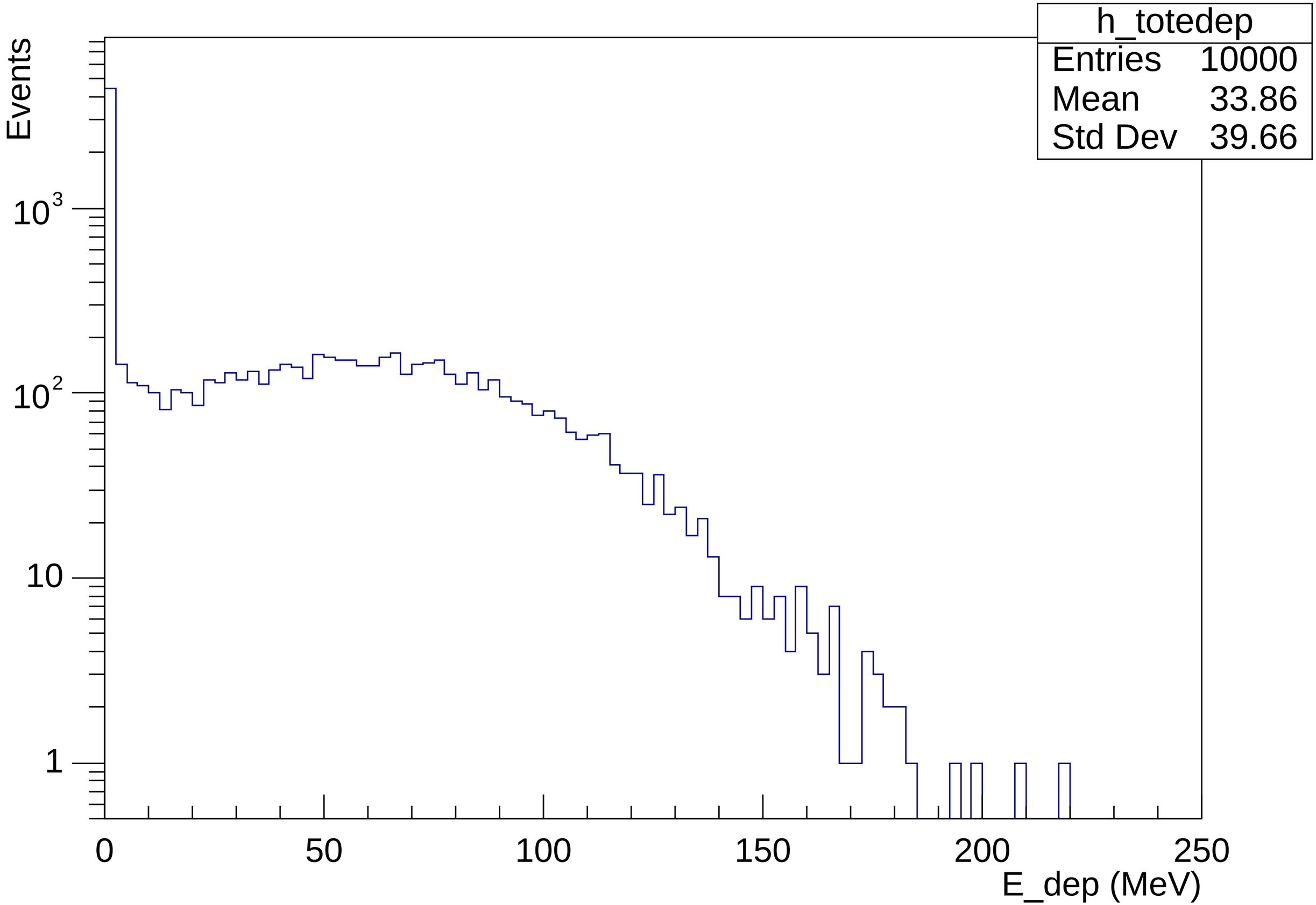
Total neutron E_dep - n100 KE



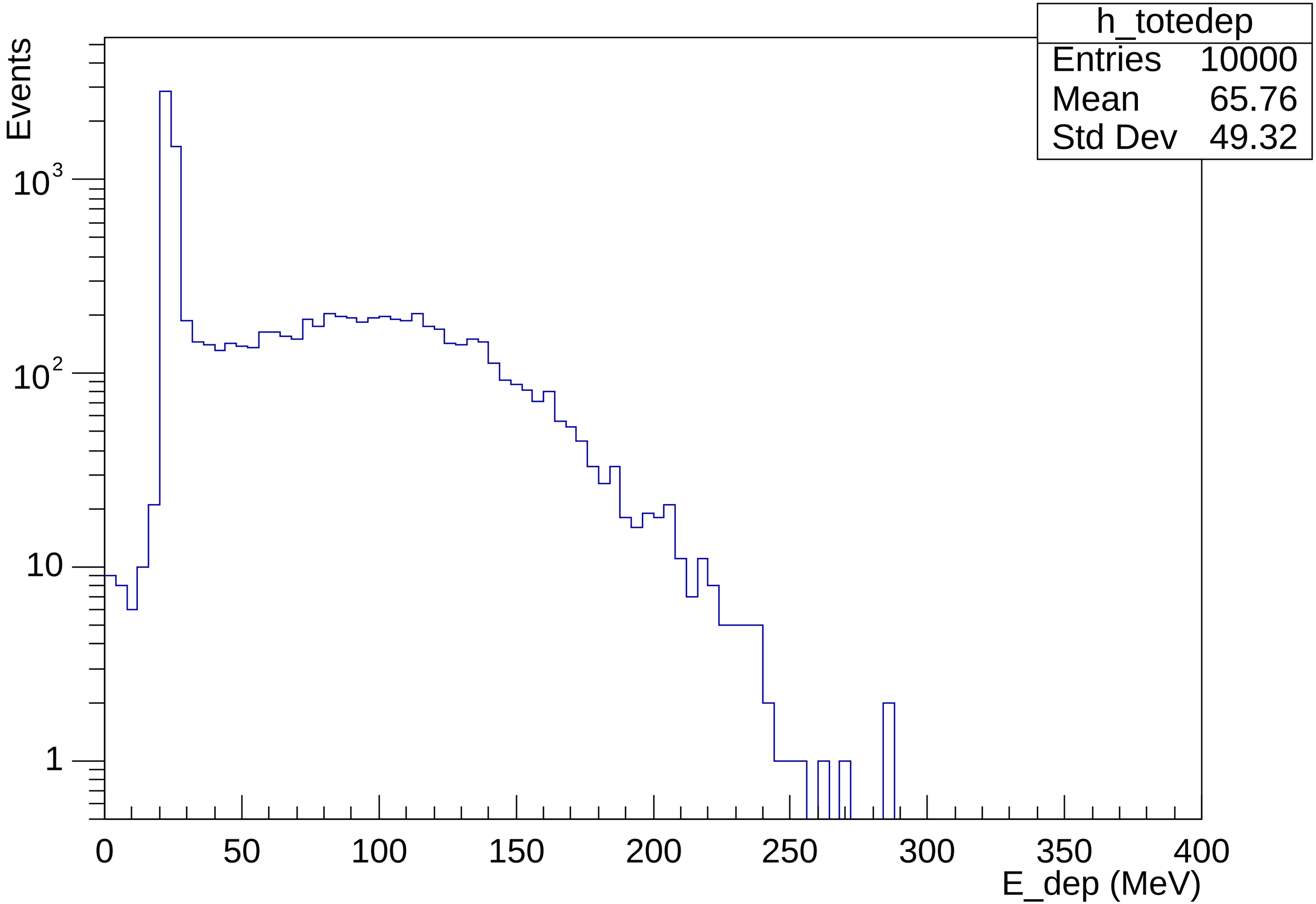
Total neutron E_dep - n300 KE



Total neutron E_dep - n500 KE



Total proton E_dep - p1gev KE



Total proton E_dep - p2gev KE

h_totedep	
Entries	10000
Mean	92.3
Std Dev	80.72

Events

10^3

10^2

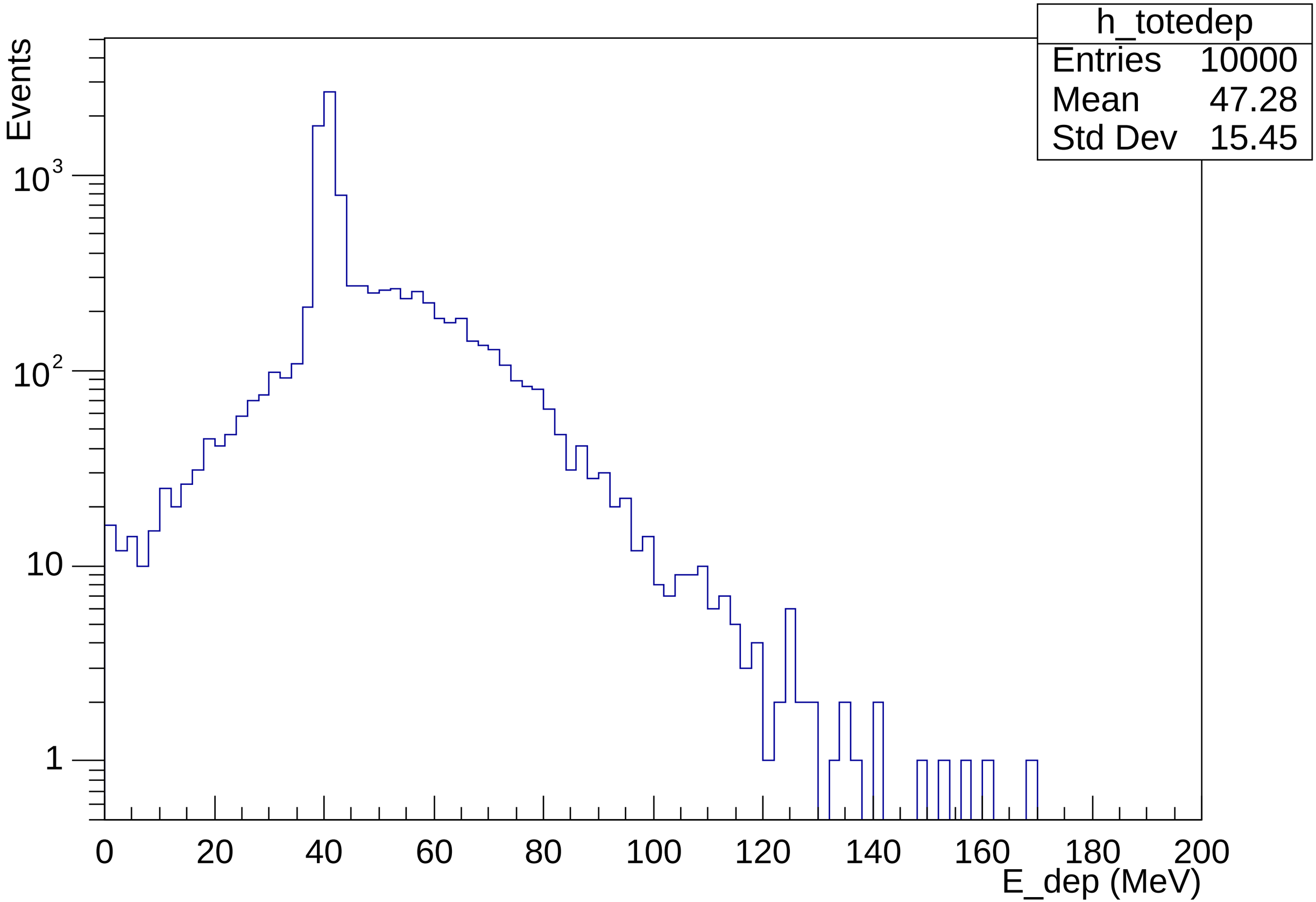
10

1

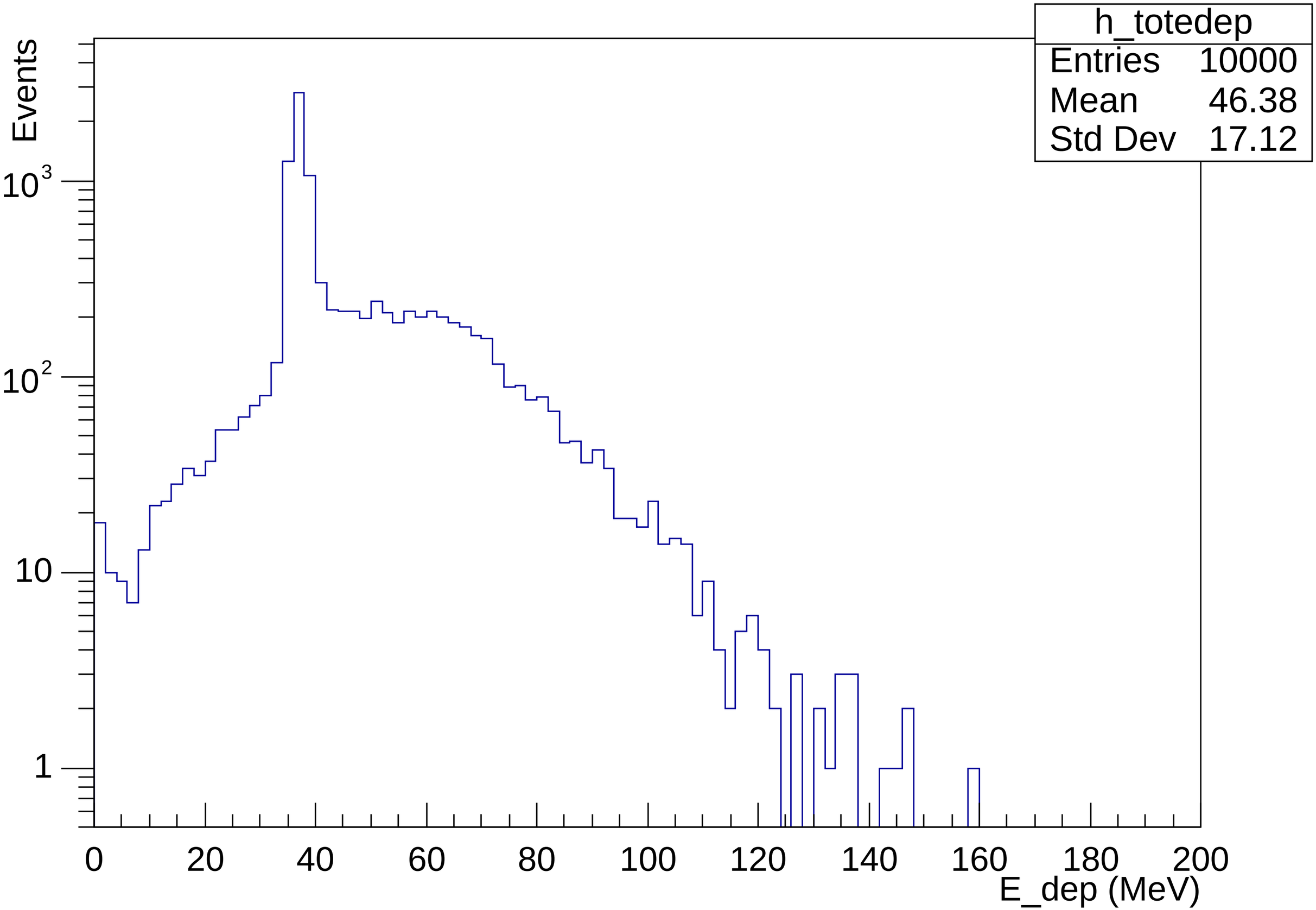
0 50 100 150 200 250 300 350 400 450

E_dep (MeV)

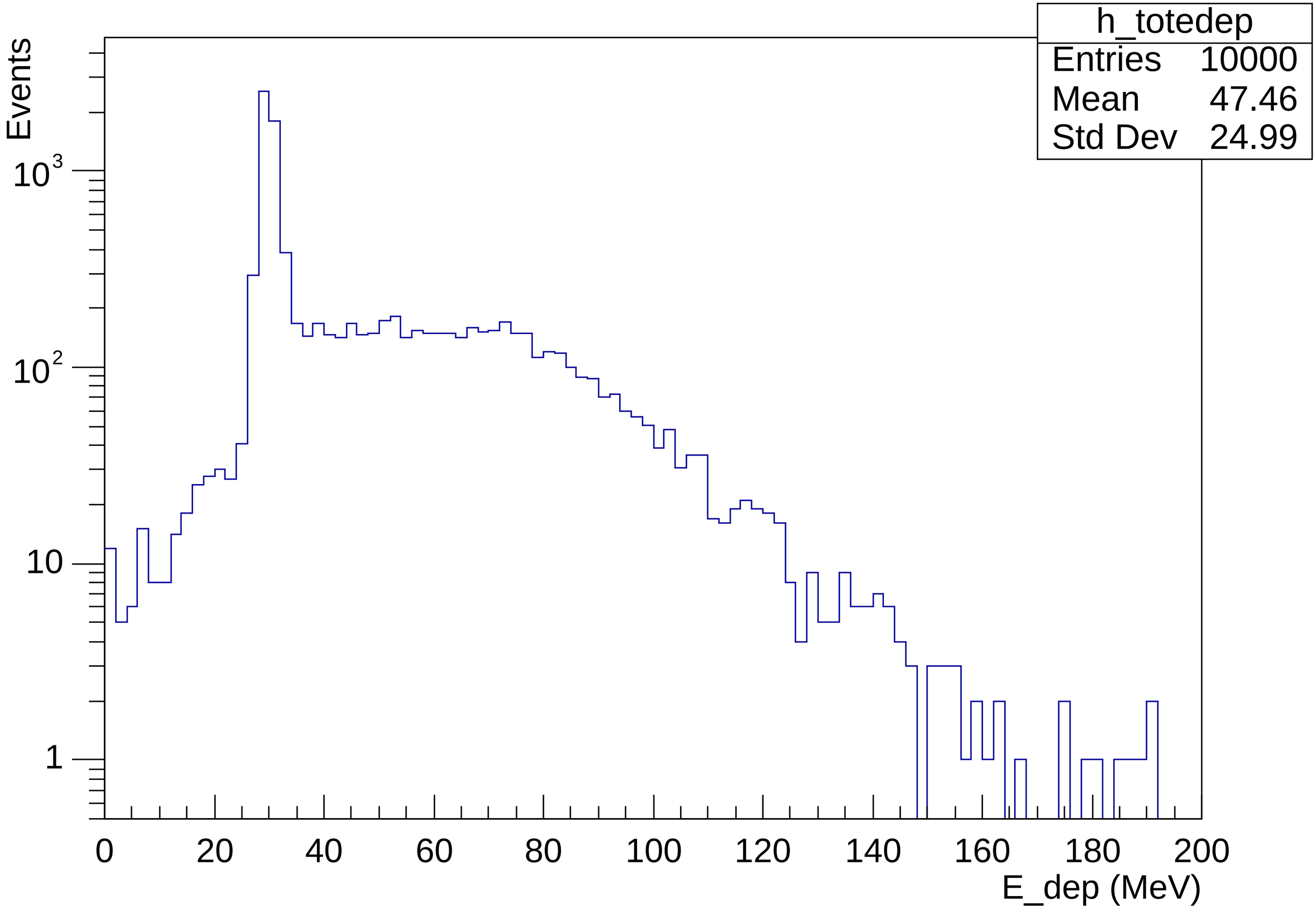
Total proton E_dep - p50 KE



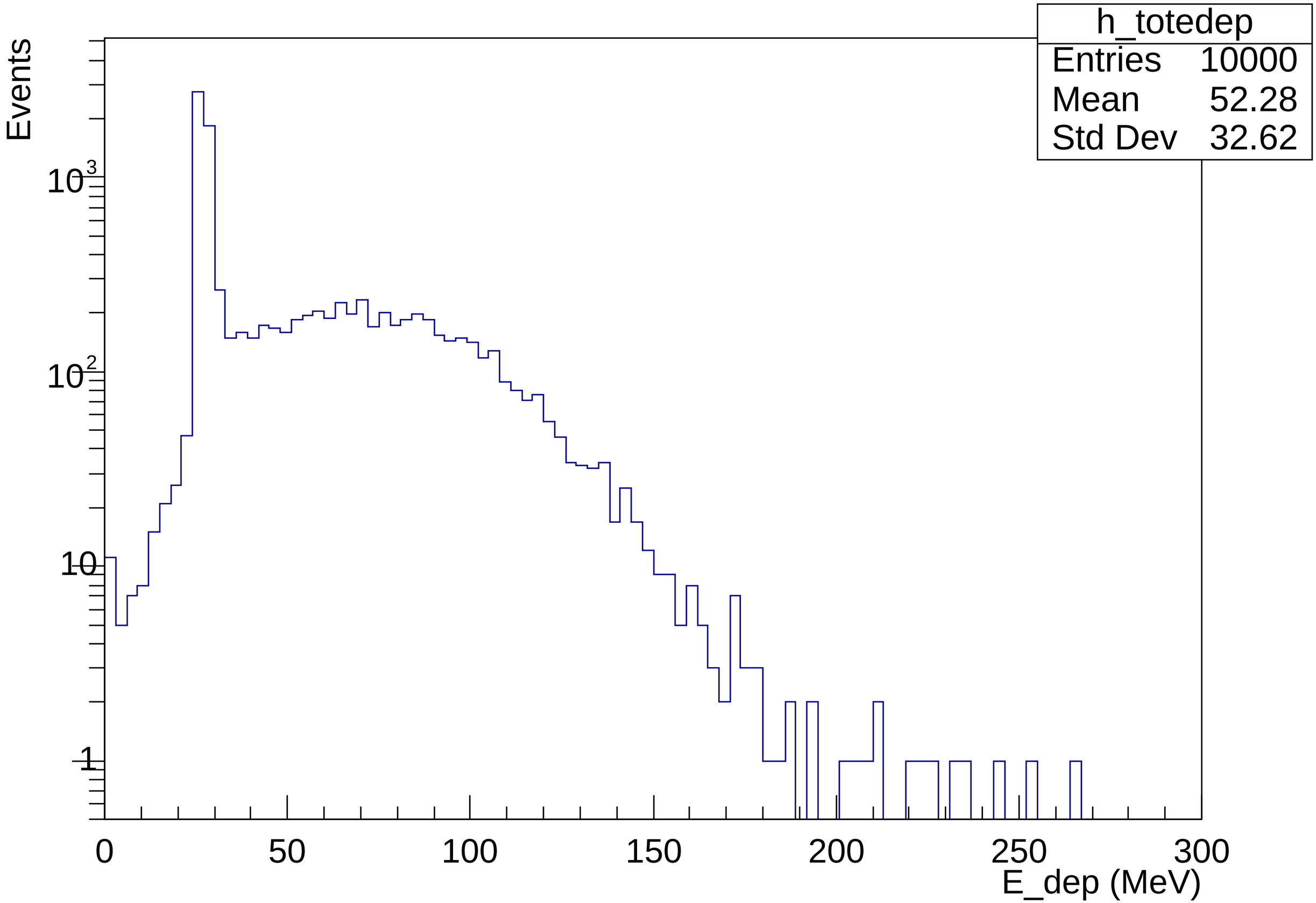
Total proton E_dep - p100 KE



Total proton E_dep - p300 KE



Total proton E_dep - p500 KE



Total gamma E_dep - photon1gev KE

h_totedep	
Entries	10000
Mean	88.15
Std Dev	11.92

Events

10^3

10^2

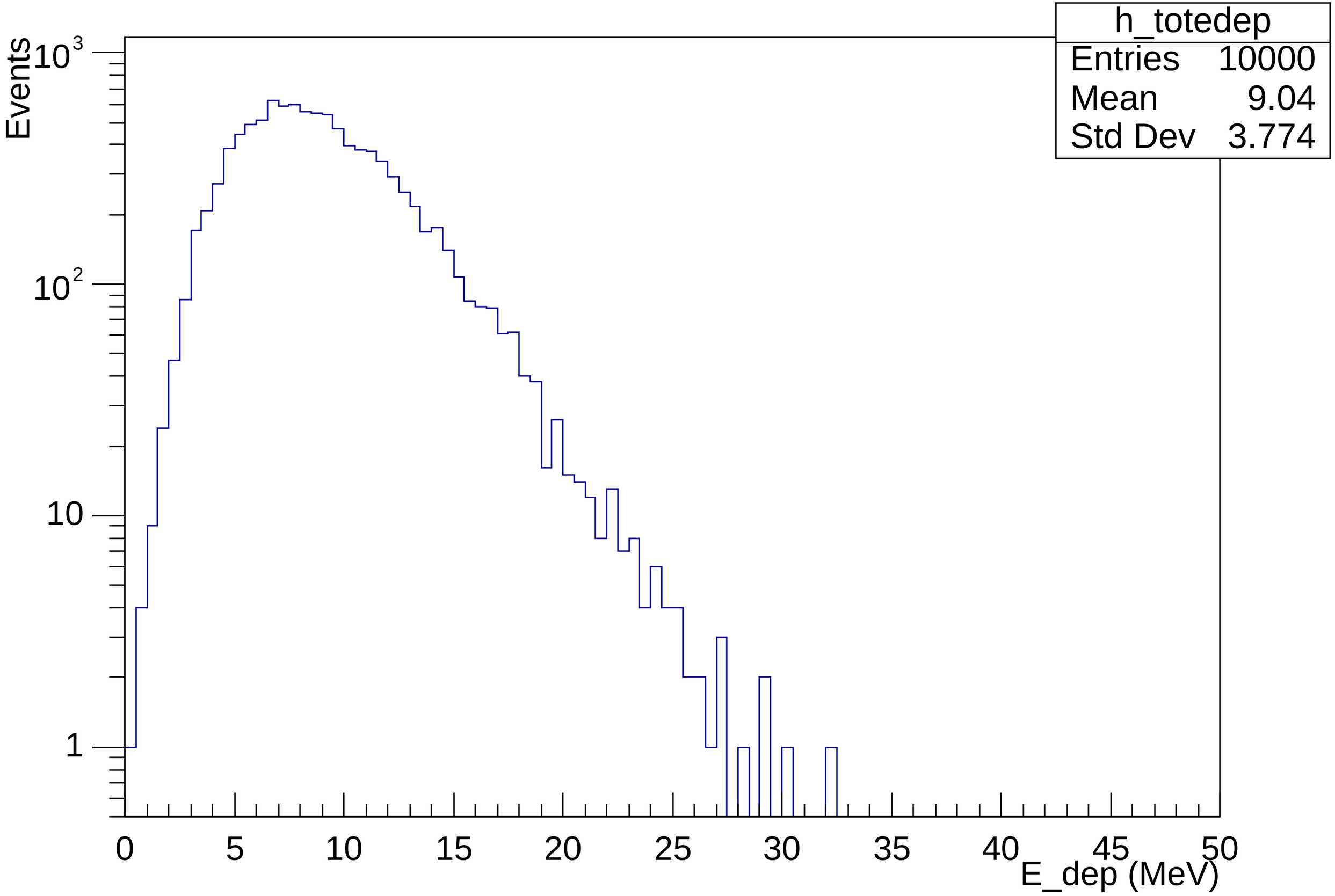
10

1

0 50 100 150 200 250

E_dep (MeV)

Total gamma E_dep - photon100 KE



Future Work

1) Add lead shielding in the front and in the middle of the calorimeter
2) Find E_dep per scintillator layer (working with Maurizio)
3) Start creating other graphs recommended by Todd