Geant4 & HEED Simulation
Ionization Energy Loss

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Geant4 Weekly Meeting: 31st May 2010

G4 9.3.p01 (EM TestEm5)

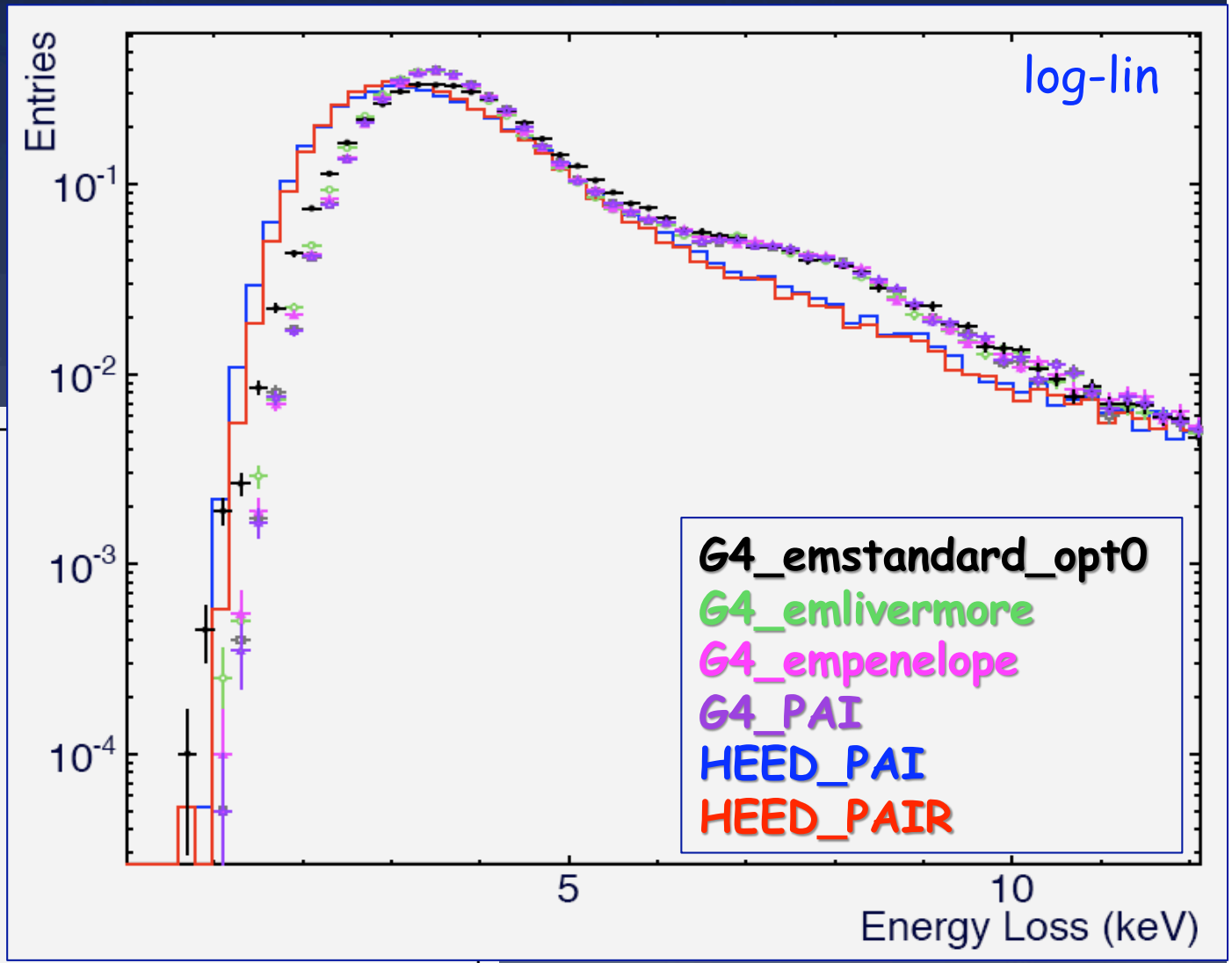
G4 Physics Lists: **emstandard_opt0**
emstandard_opt3
emlivermore
empenelope
PAI

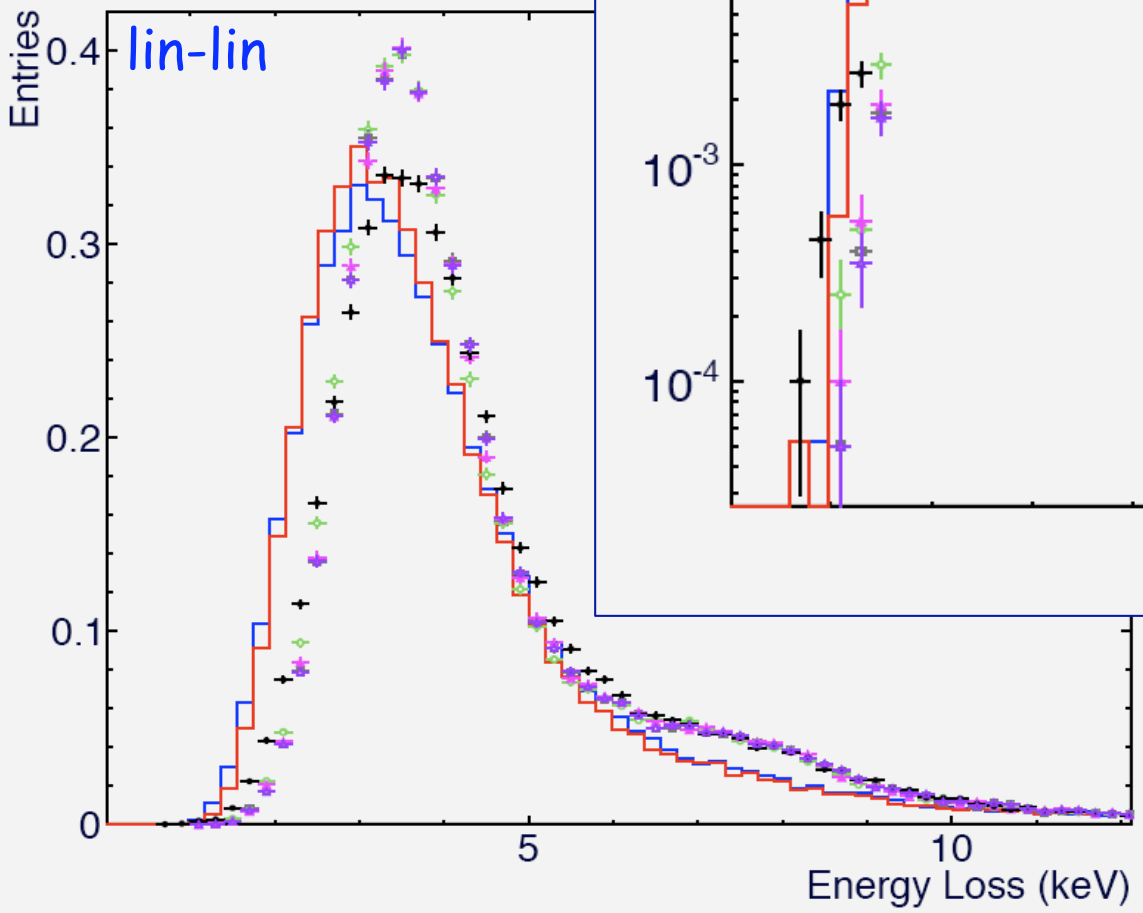
HEED: **PAI**
PAIR

Description: Ionization energy loss distibution produced by electrons with a momentum of 25 GeV/c in a gas mixture 80% Ar and 20% CO_2, with 1.5 cm thickness.

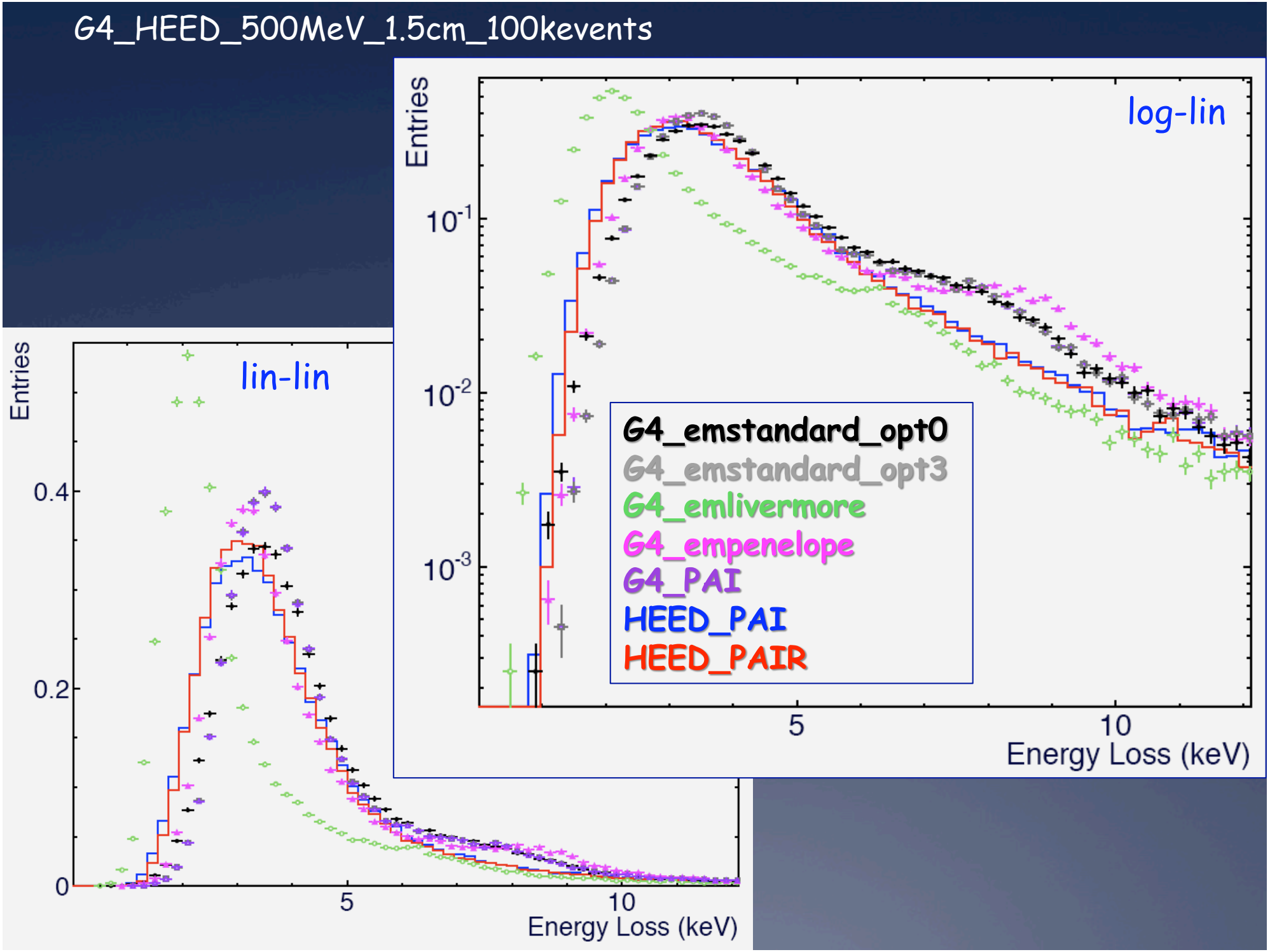
Apostolakis *et al.* doi:10.1016/S0168-9002(00)00457-5

G4_HEED_25GeV_1.5cm_100kevents



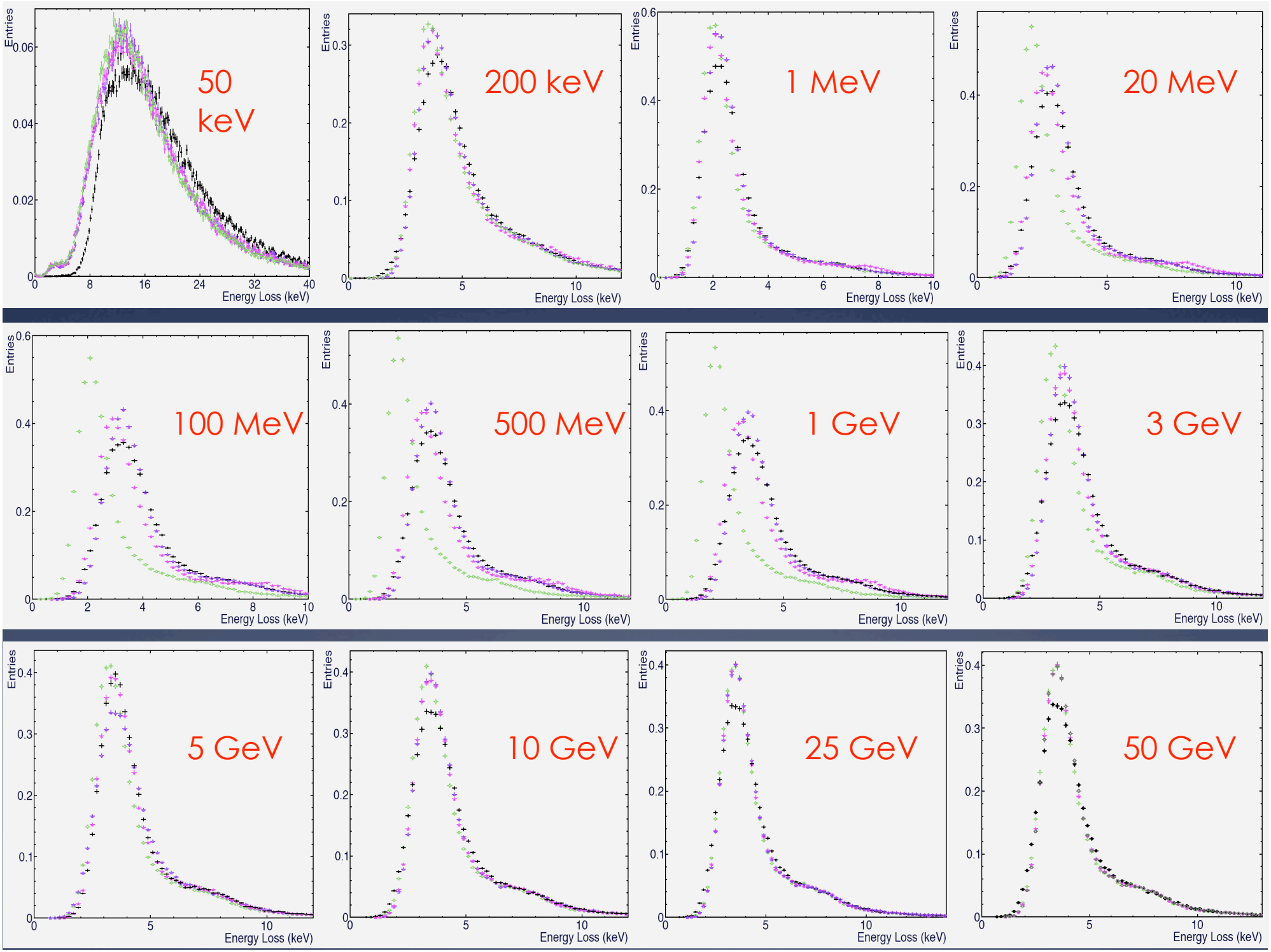


G4_HEED_500MeV_1.5cm_100kevents

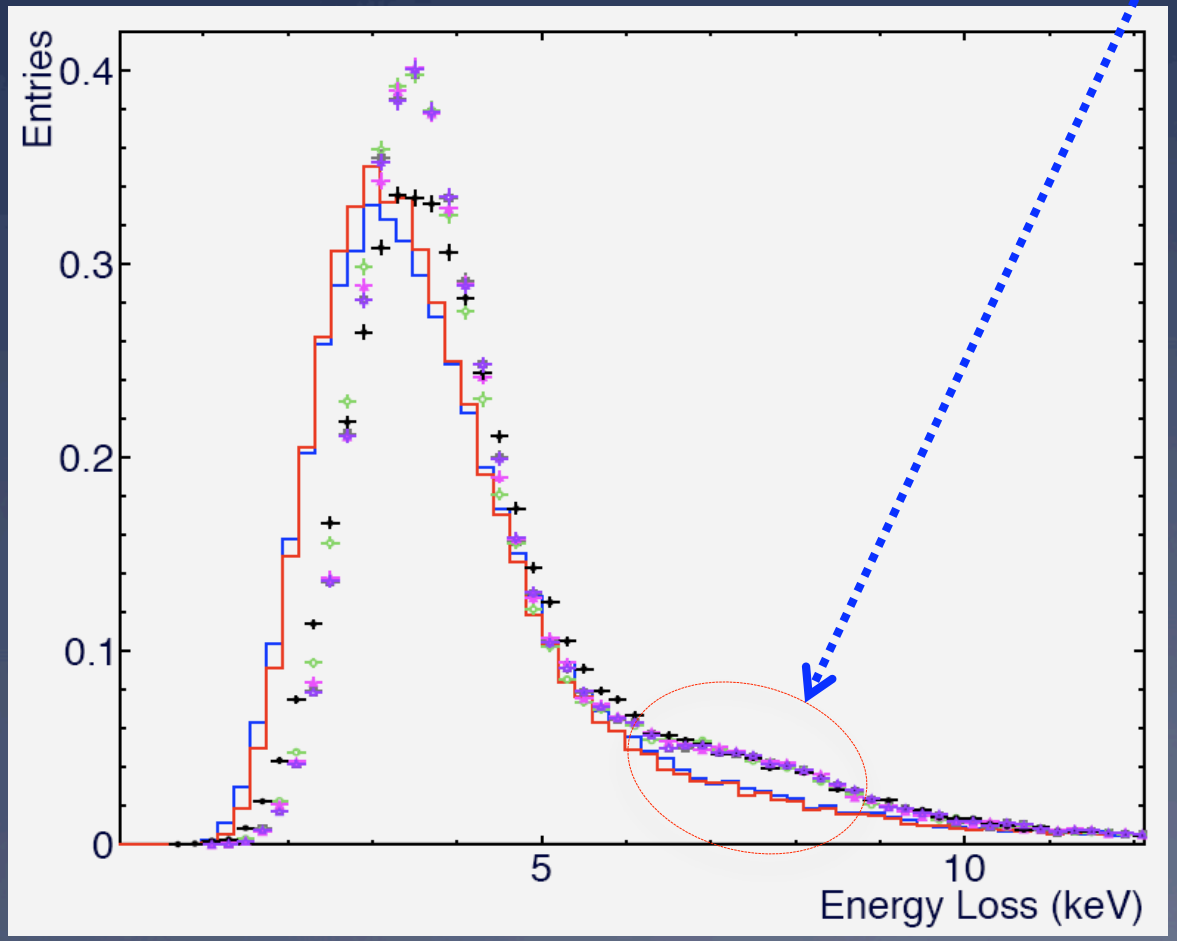


- emlivermore's (& empenelope's)

energy-dependent behavior

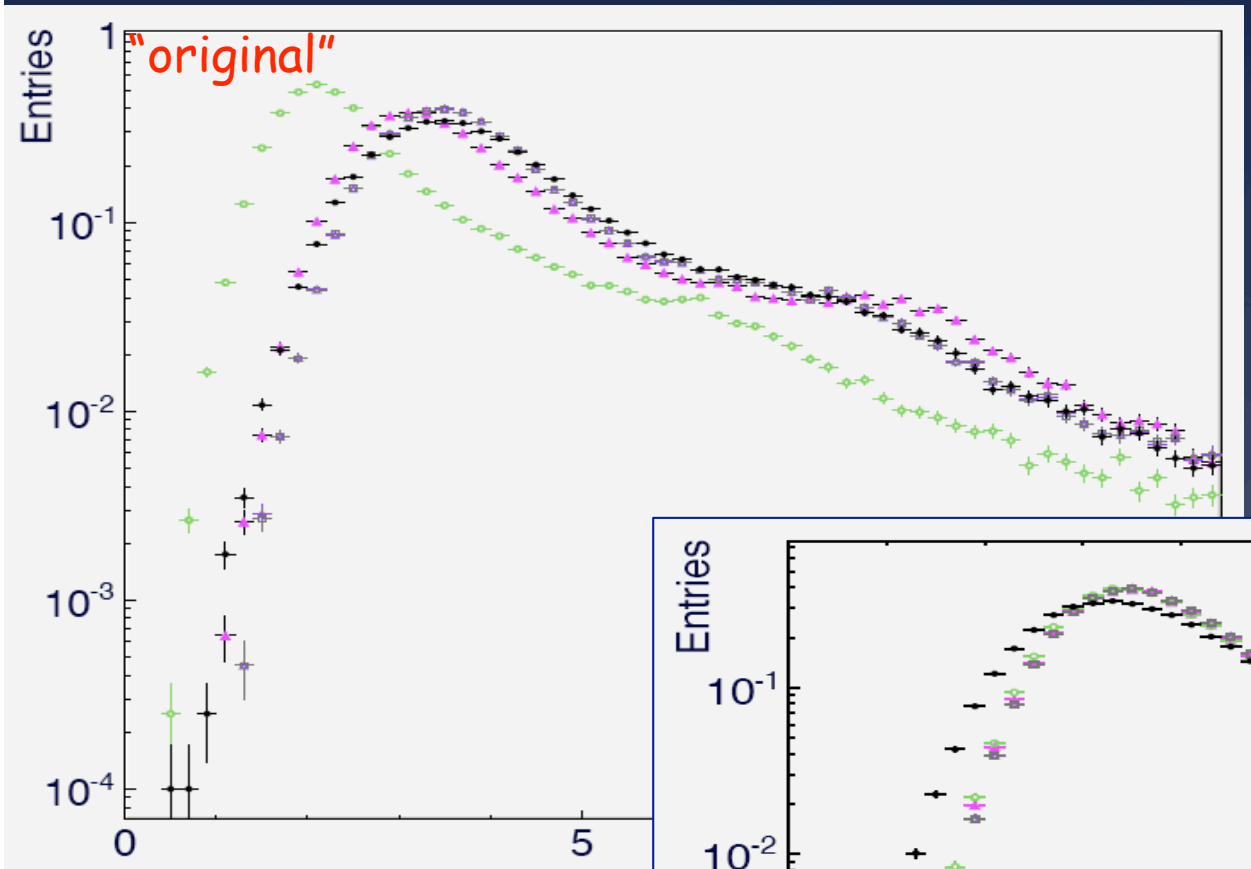

50 keV
200 keV
1 MeV
20 MeV
100 MeV
500 MeV
1 GeV
3 GeV
5 GeV
10 GeV
25 GeV
50 GeV
Entries
Energy Loss (keV)

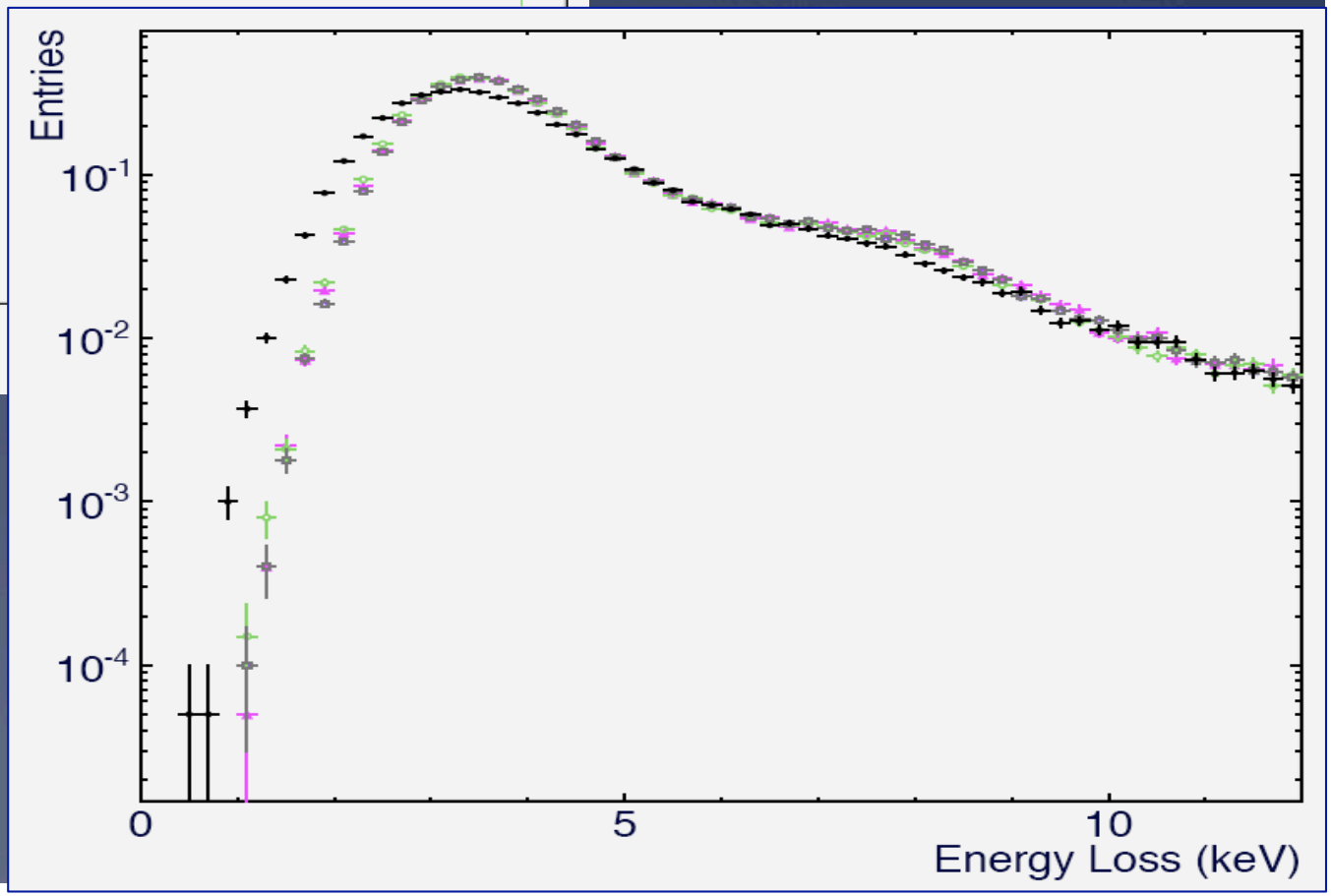
The "second peak" at ~8 keV



- Secondaries
- Thickness
- Processes
- Cuts

G4_500MeV_1.5cm_100kevents_killSecondaries

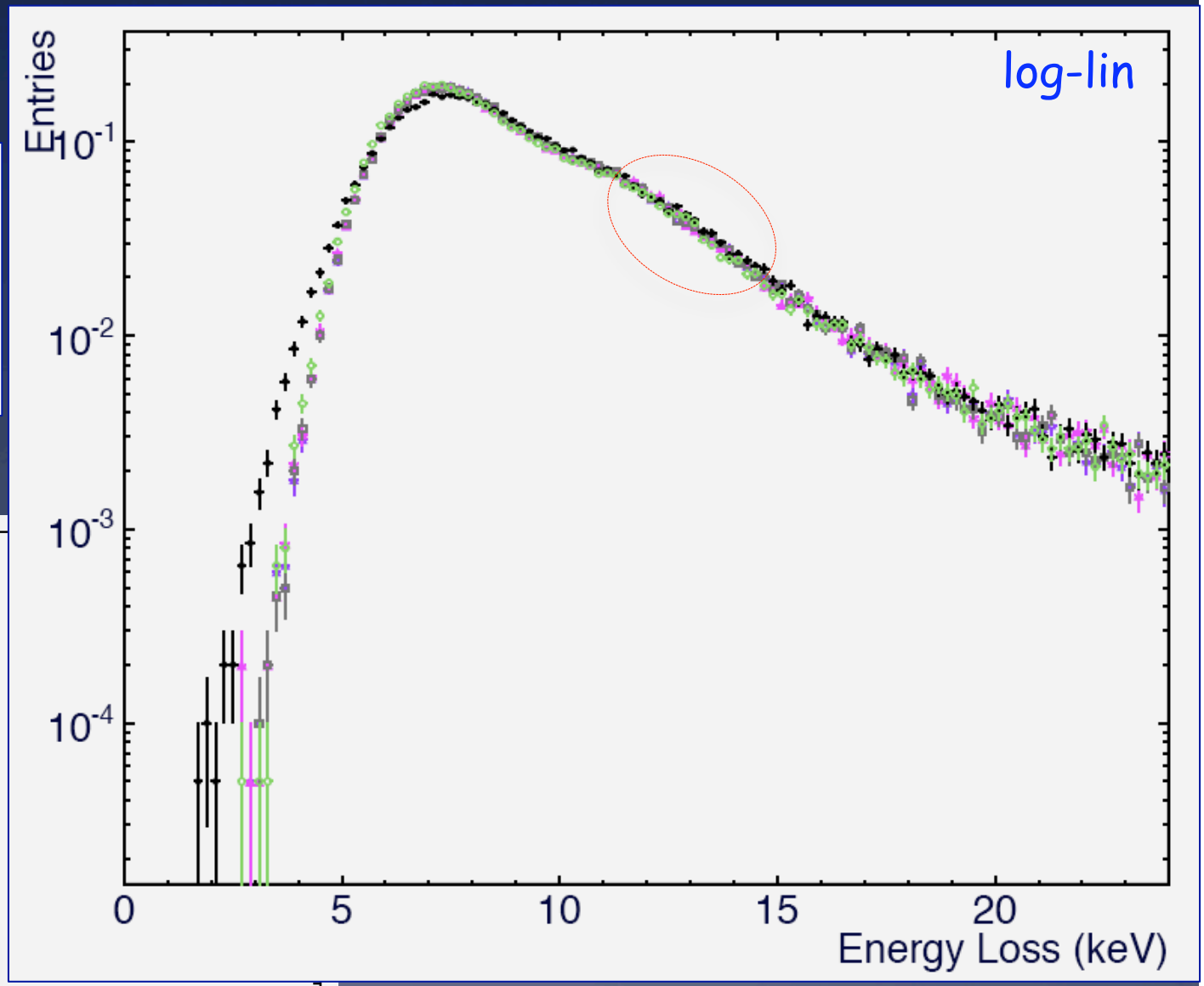


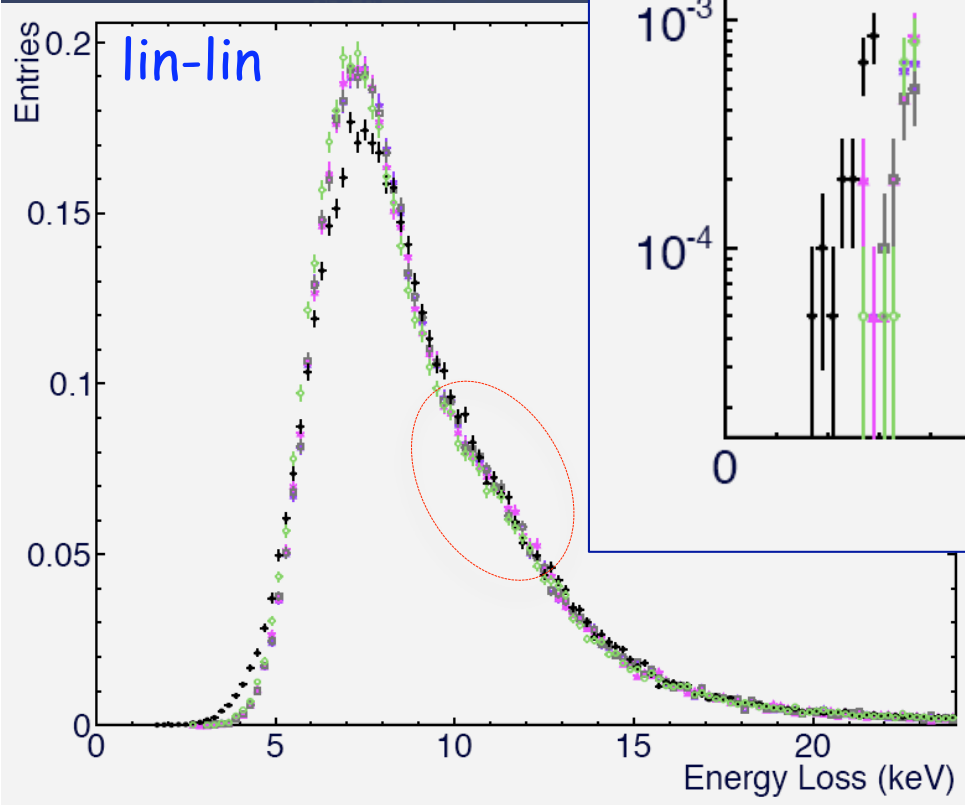


G4_emstandard_opt0
G4_emstandard_opt3
G4_emlivermore
G4_empenelope
G4_PAI

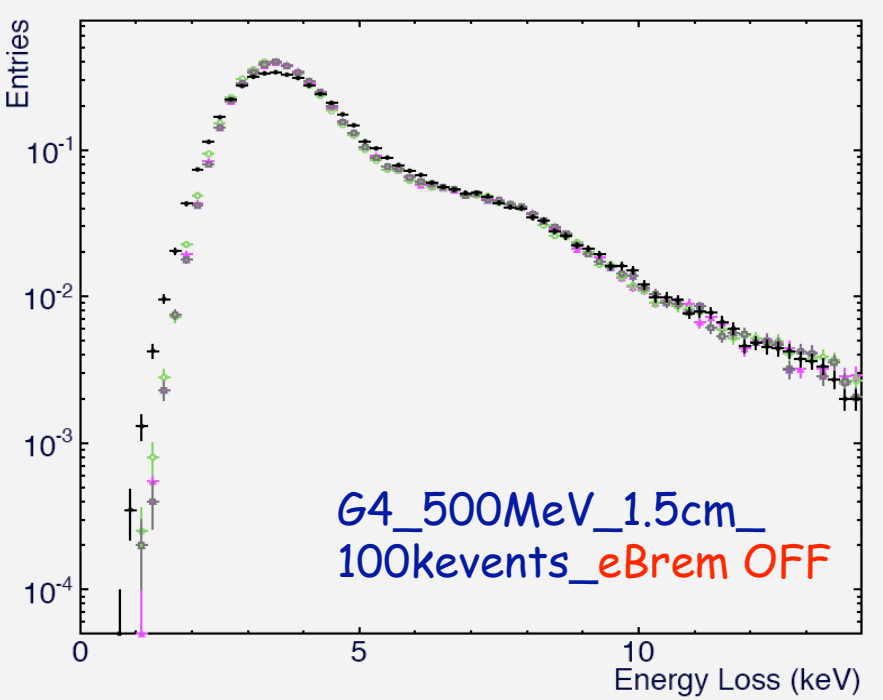
G4_500MeV_3cm_100kevents_DoubleThickness

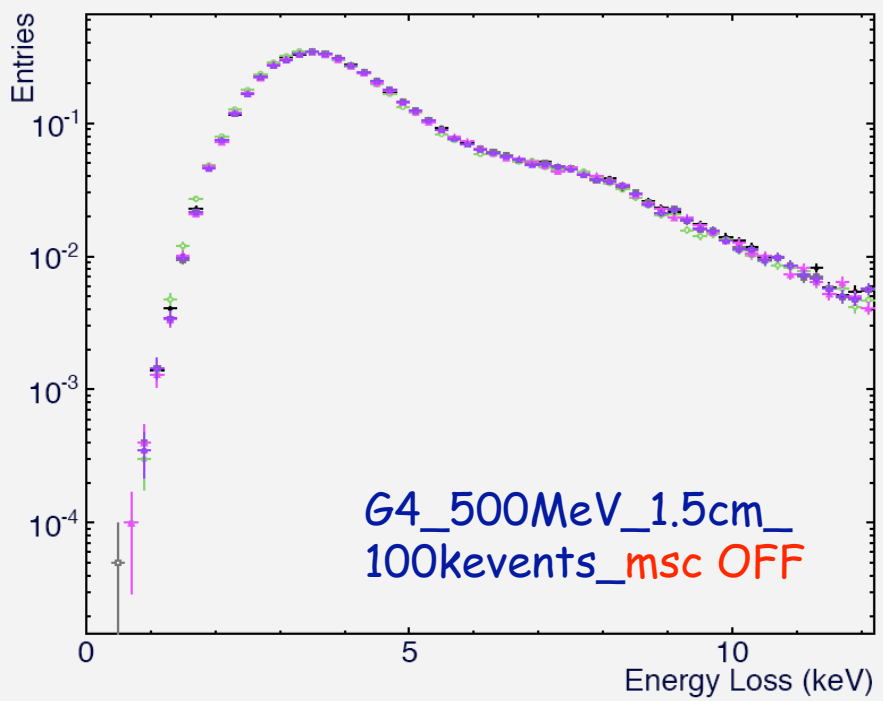
G4_emstandard_opt0
G4_emstandard_opt3
G4_emlivermore
G4_empenelope
G4_PAI

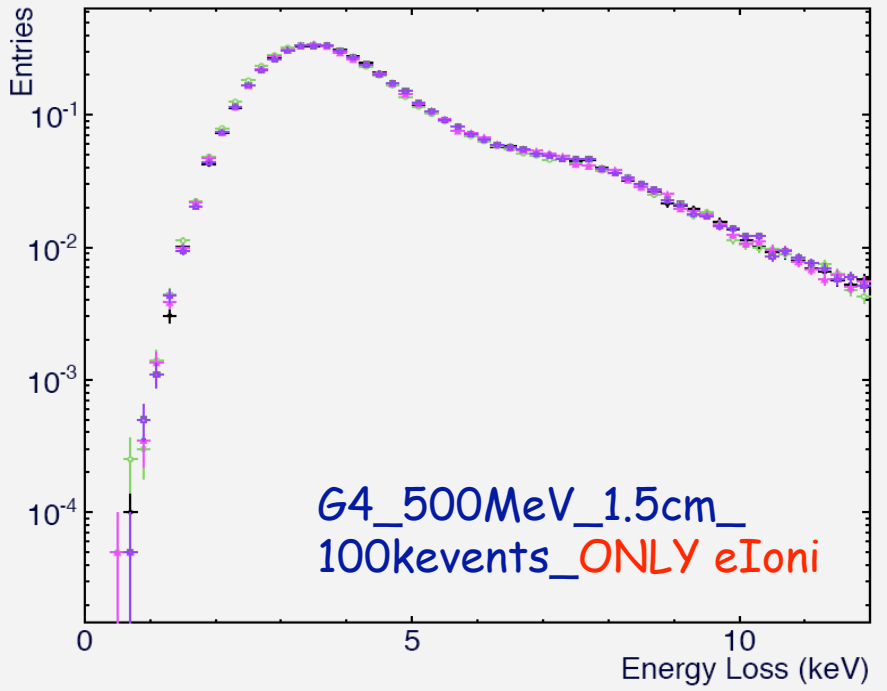


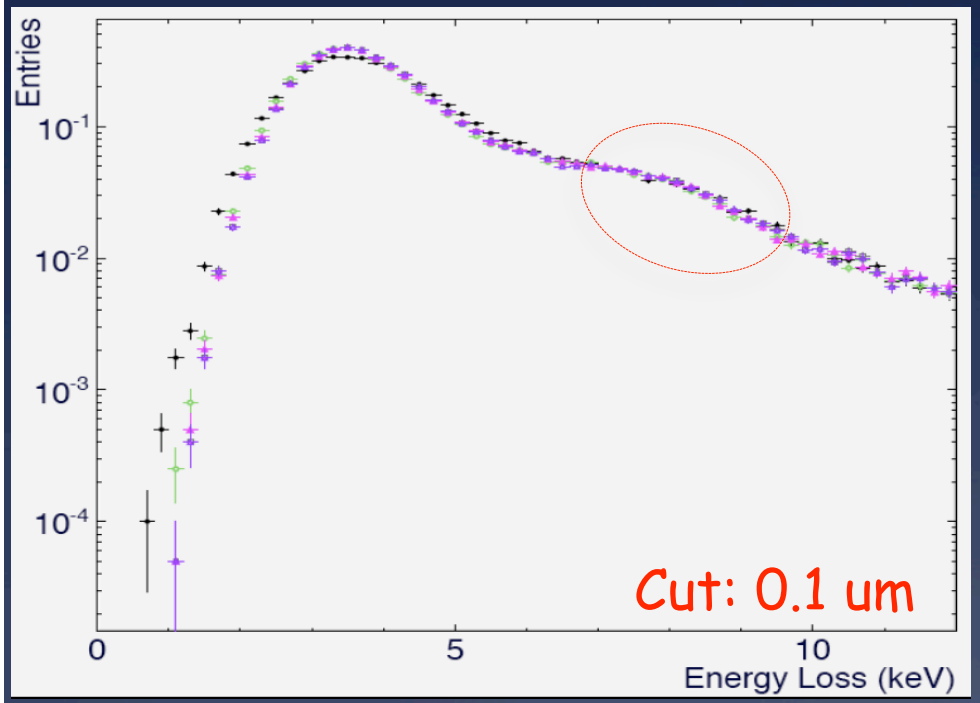
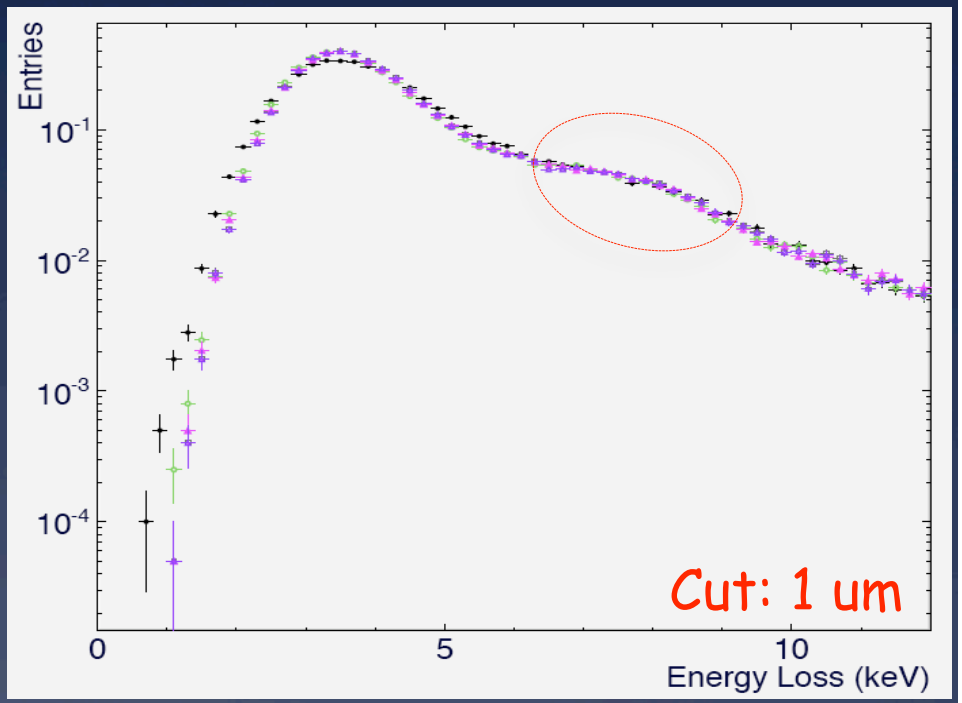
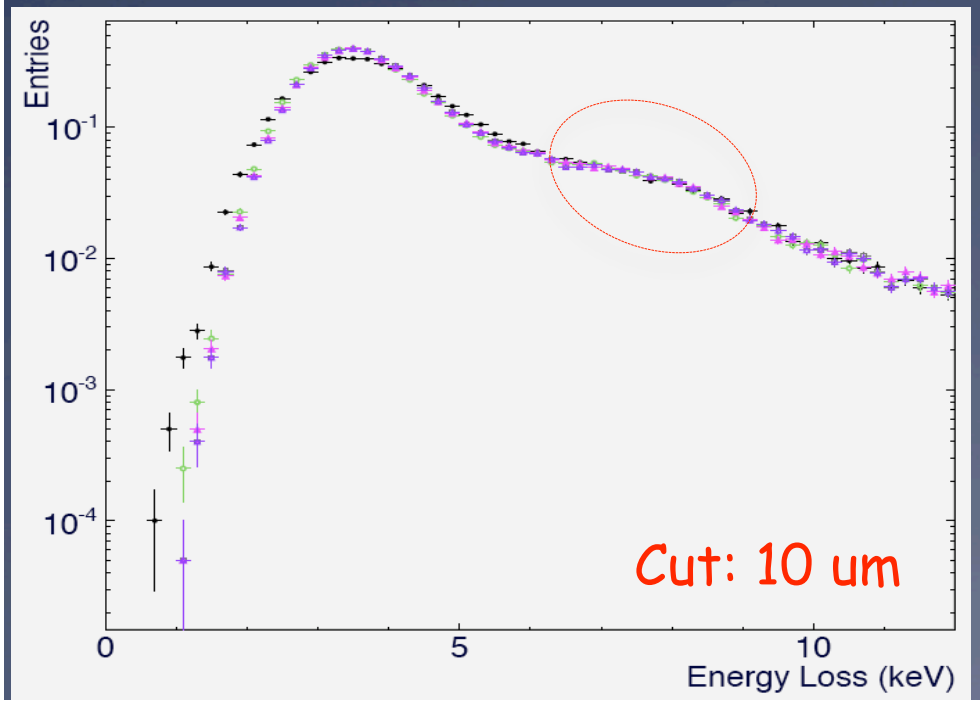
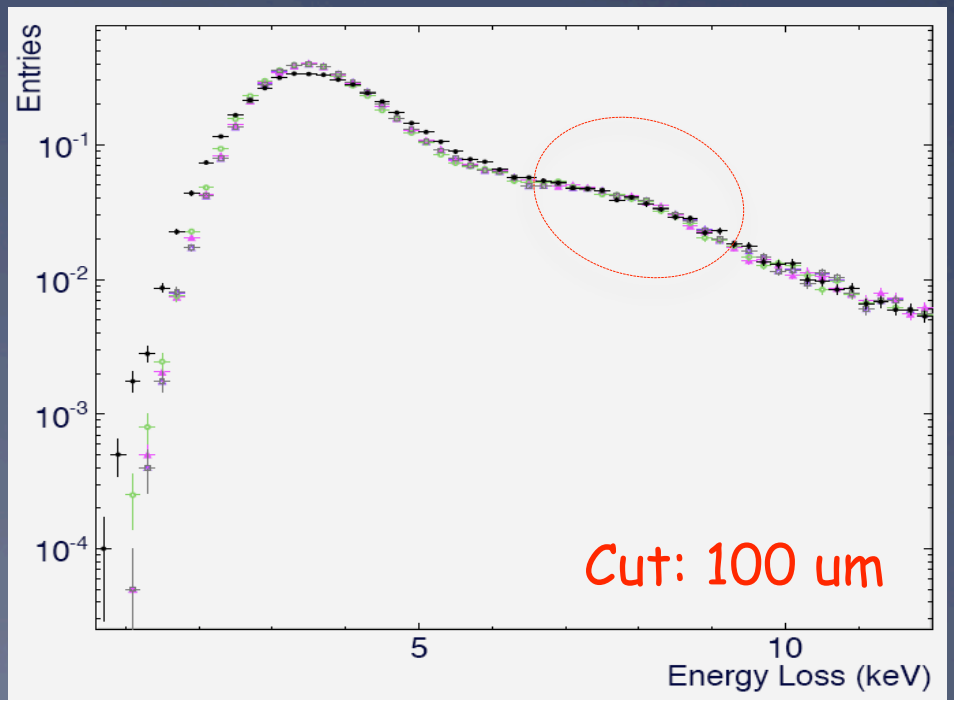


G4_500MeV_1.5cm_100kevents_Inactivate Processes







G4_emstandard_opt0
G4_emstandard_opt3
G4_emlivermore
G4_empenelope
G4_PAI

G4_500MeV_1.5cm_100kevents_Change Cuts