

Simulation of ^4He events @ 700 MeV/u

Milano group

Motivations

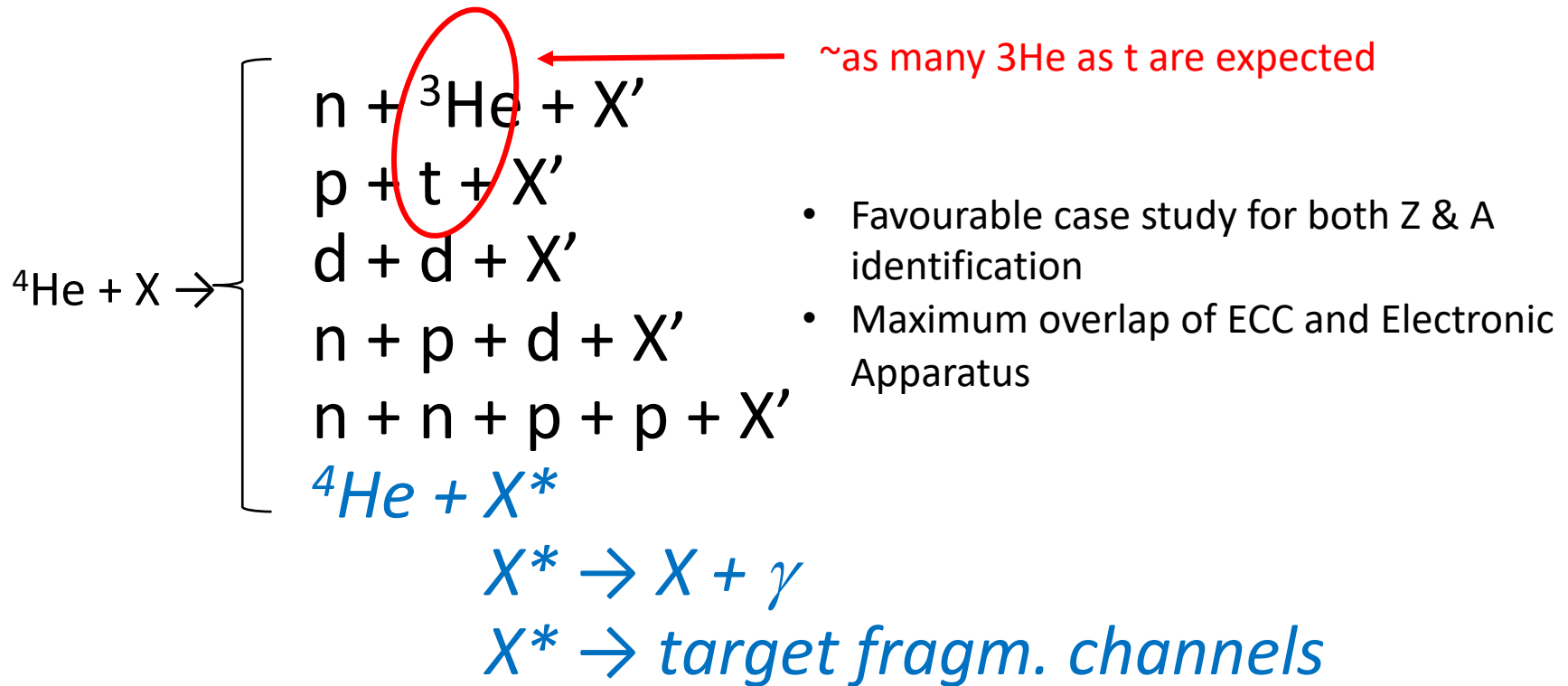
(see slides from Meeting of March 4th)

In view of the call of GSI BioPac for 2021/2022 beam time, FOOT we are reiterating and improving the proposal already presented in 2017.

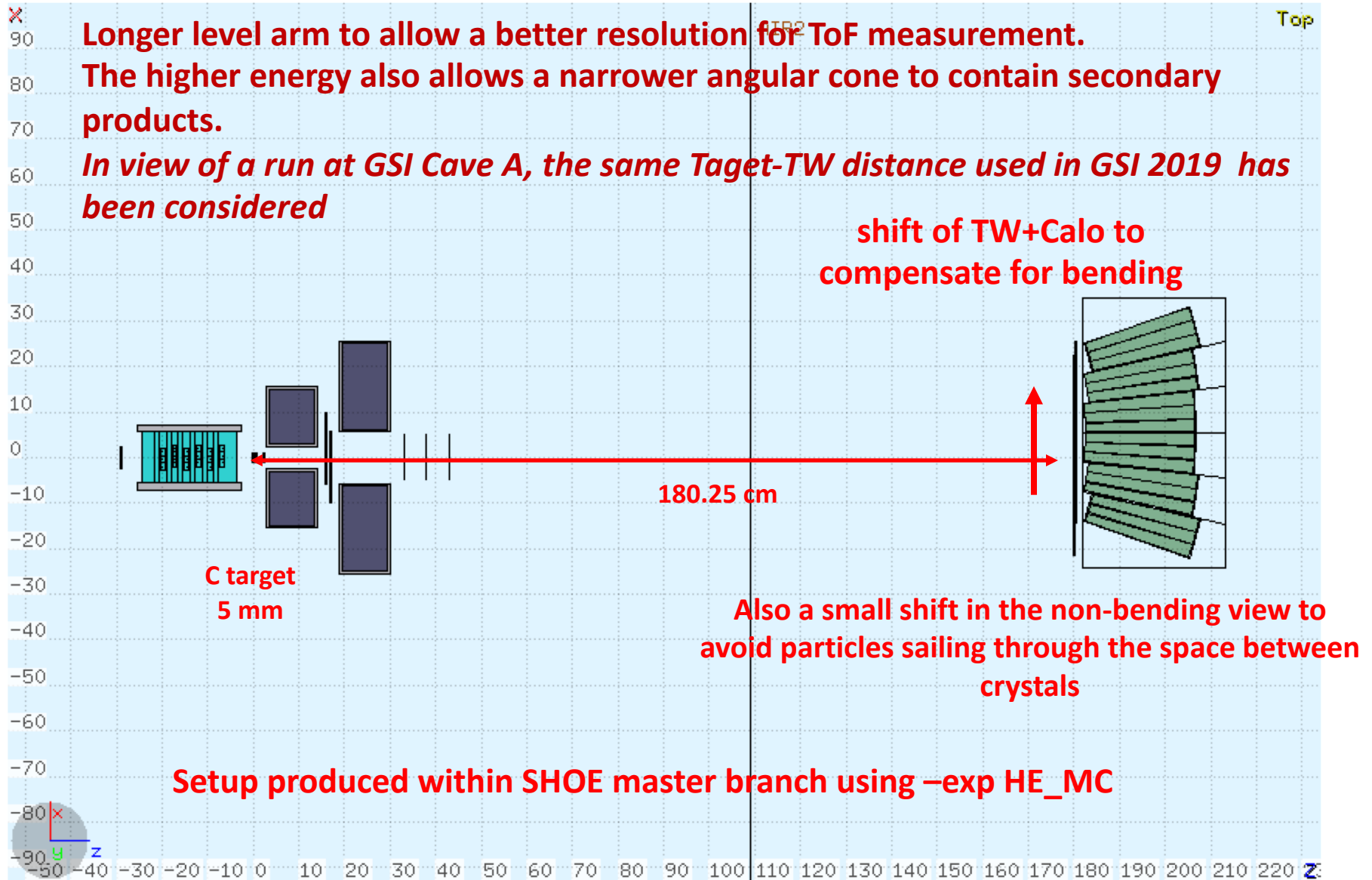
One of the major points is to apply for ion beams which are difficult to obtain outside GSI: in particular ^4He and ^{16}O .

The case of ^4He 0.7 GeV/u is considered for space radioprotection

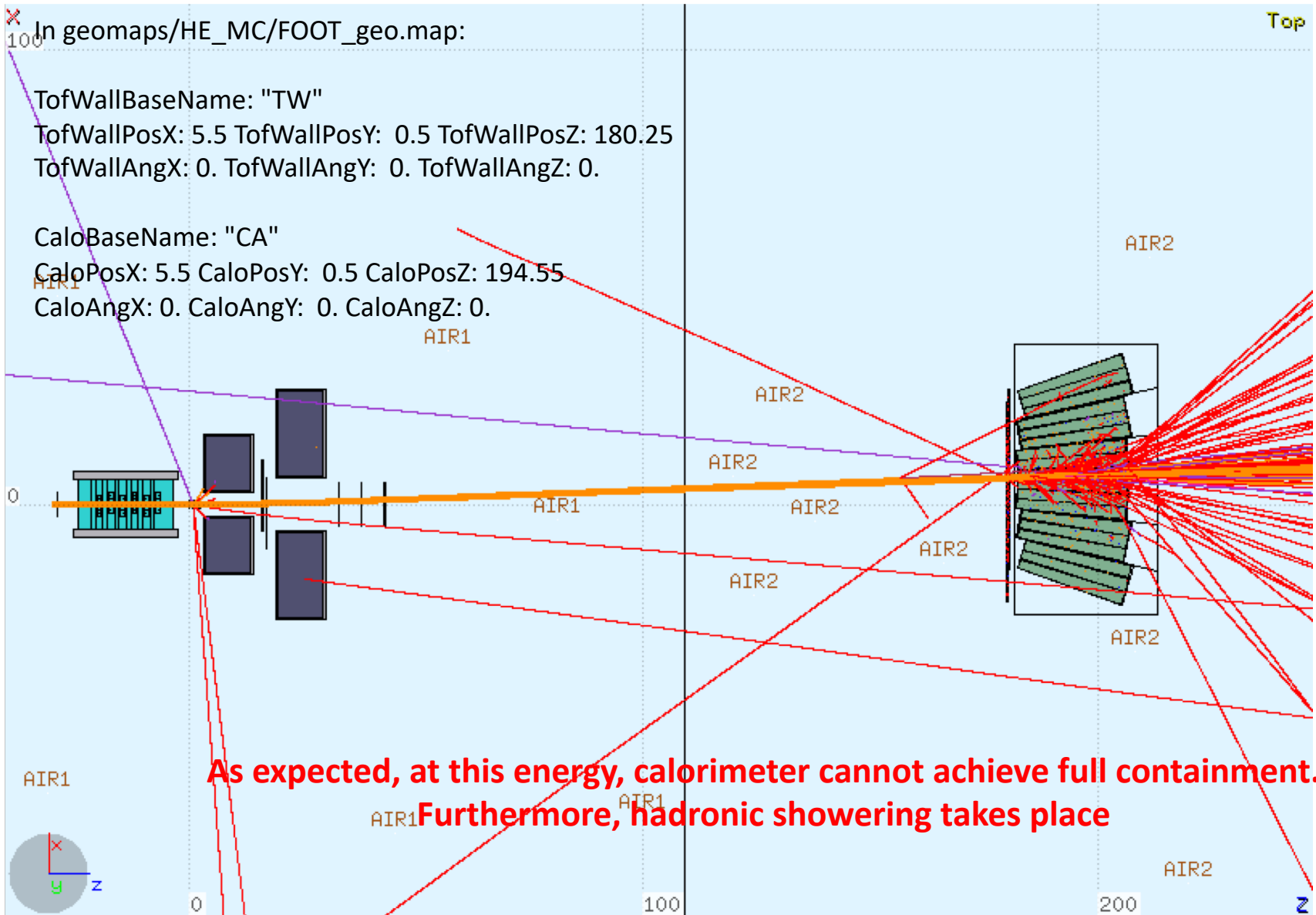
Using ^4He projectiles, the only final state channels (excluding target fragmentation) are:



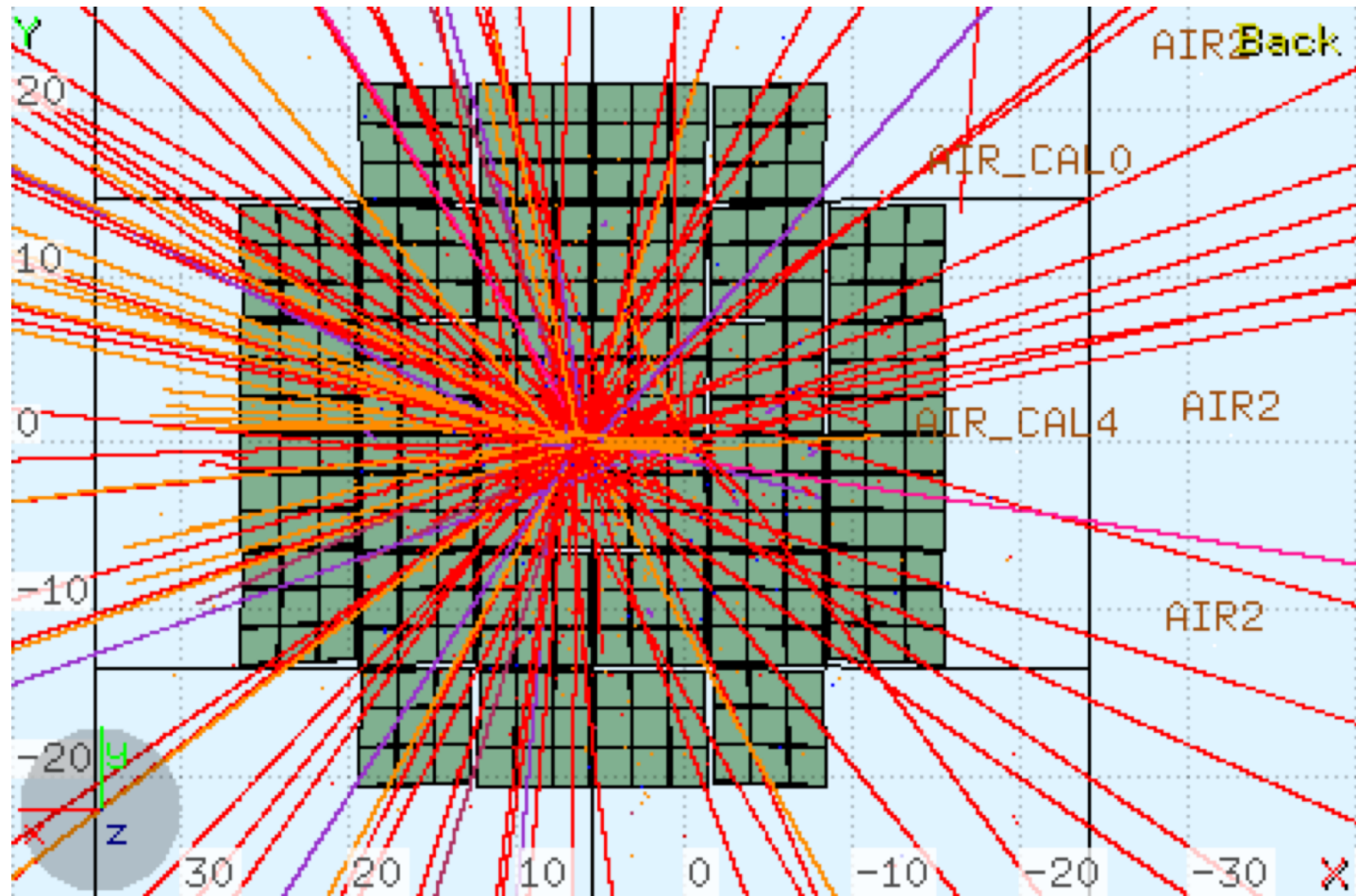
Proposed Geometry



Compensation for bending



Transv. view



Simulated Data (FLUKA pro Version 2020.0)

`/gpfs_data/local/foot/Simulation/newgeom_v1.0/HE_MC`

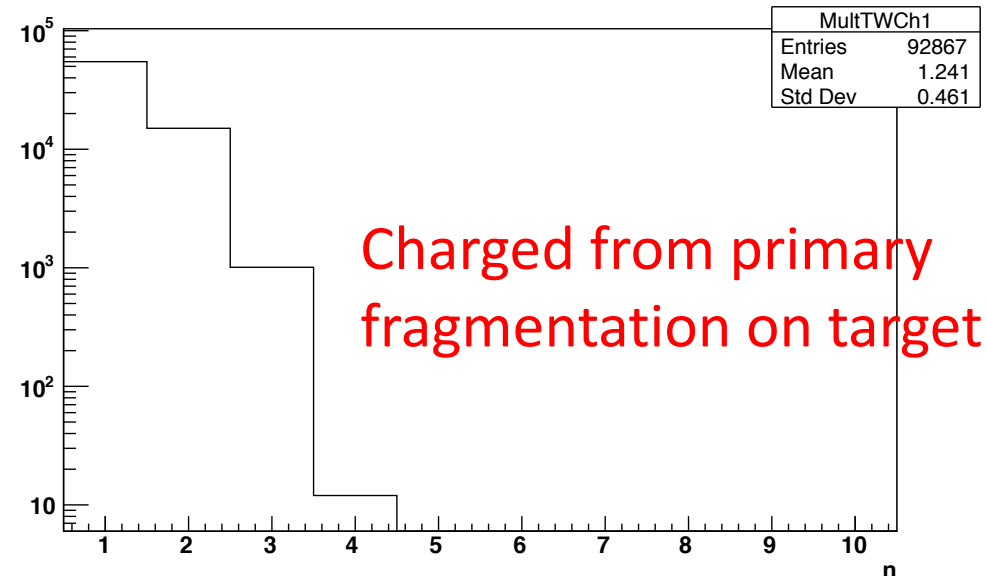
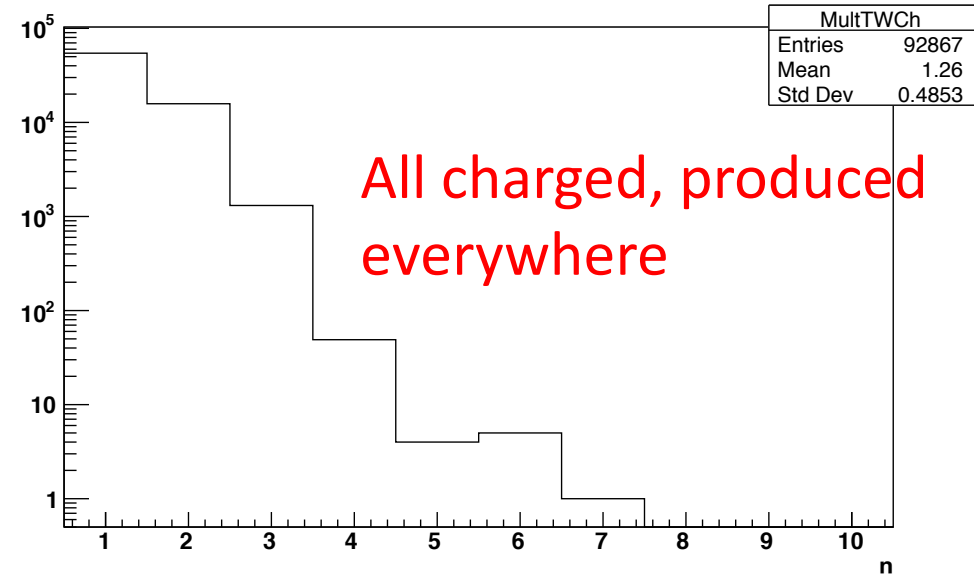
4He_C_270_1.root (5 10⁶ primaries, 46689 ev.)

4He_C_200_2.root (5 10⁶ primaries, 46178 ev.)

*As usual, a «software trigger» is implemented to write **only** events in which there was at least one inelastic interaction of primary in target*

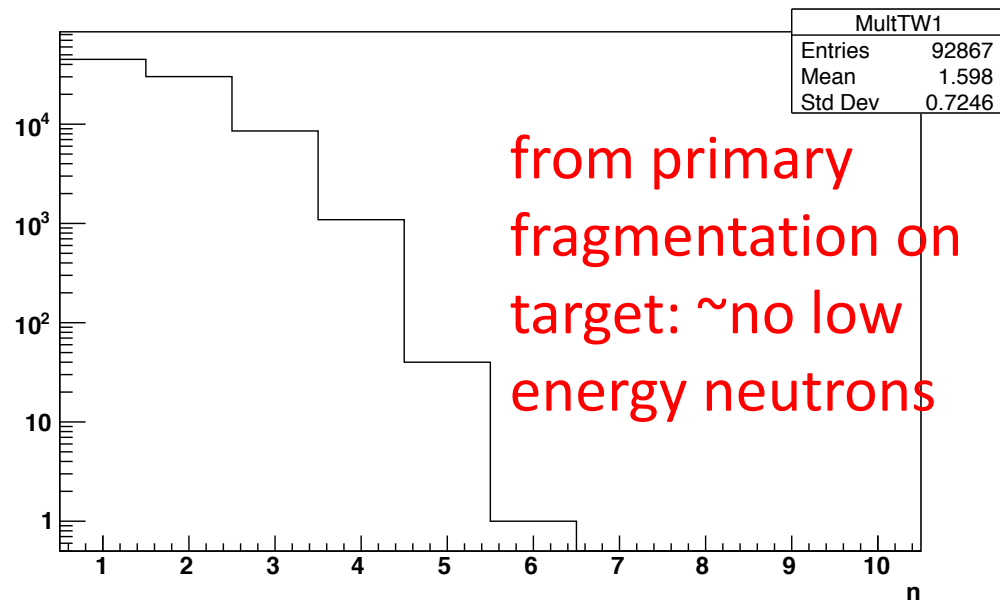
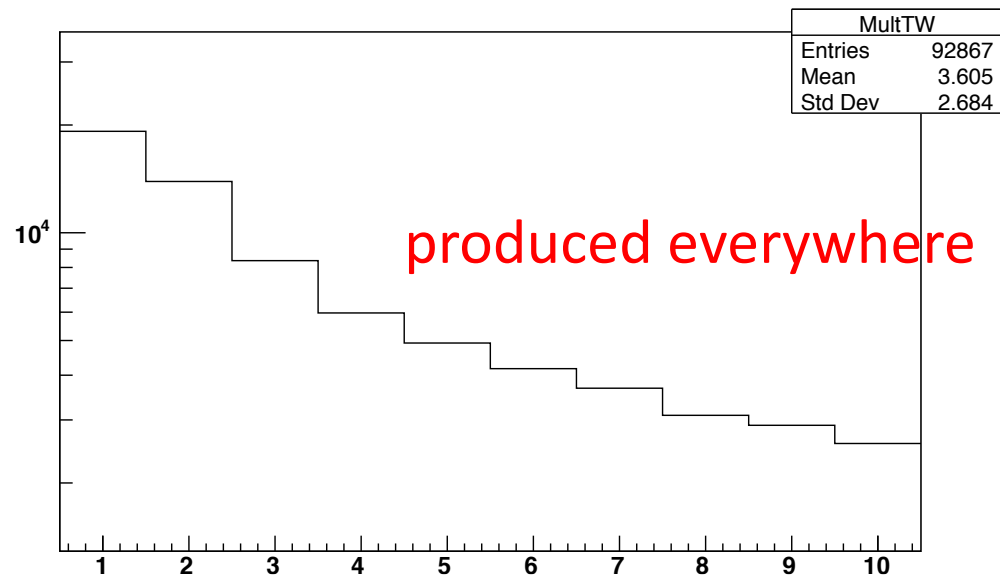
A few very preliminary plots: multiplicity per event at TW

Multiplicity of charged particles arriving at TW

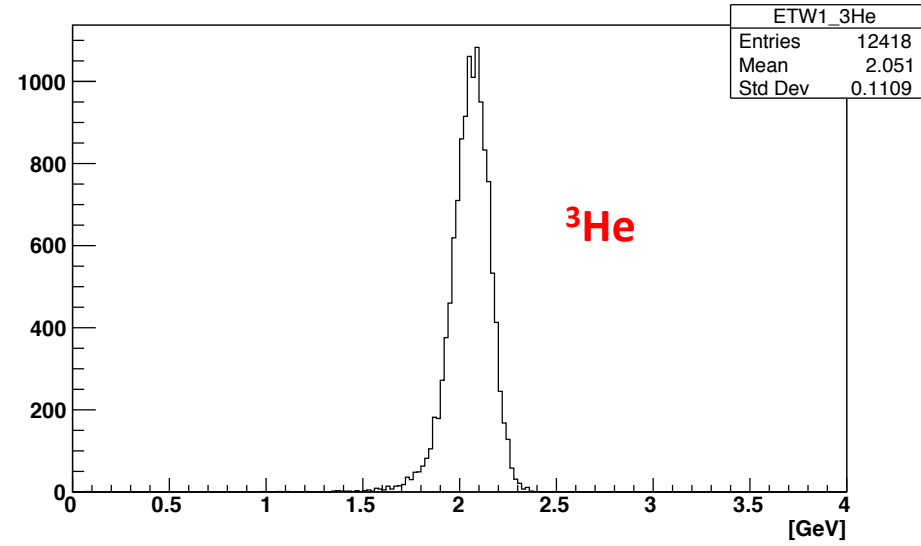
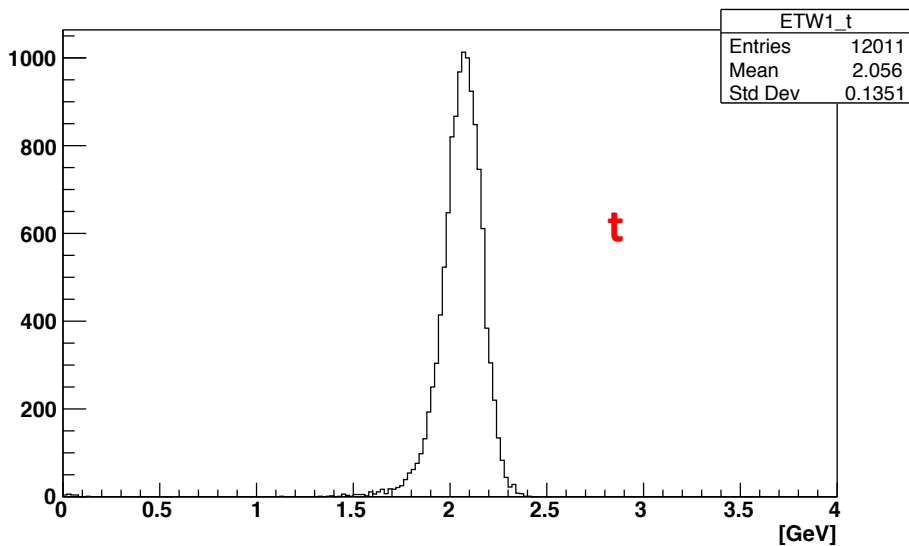
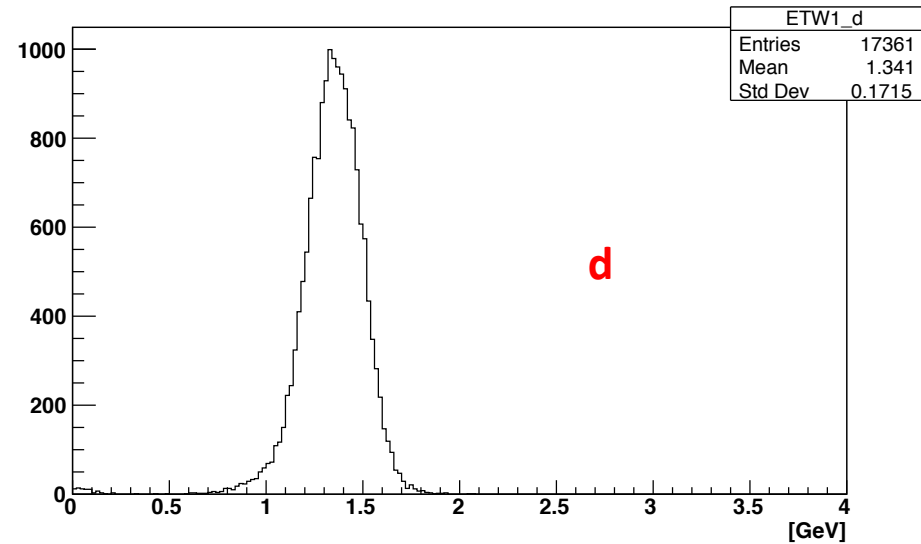
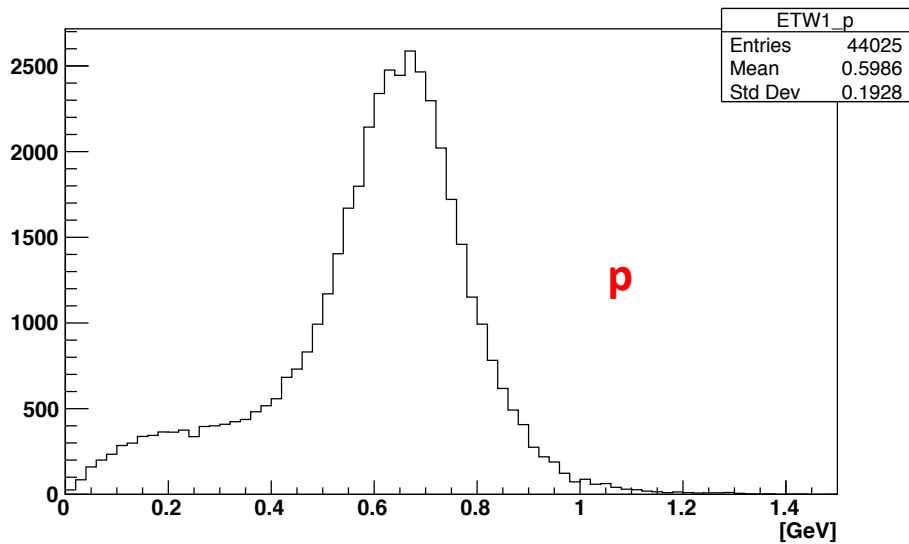


Multiplicity per event at TW - 2

Multiplicity including neutrons
(no energy cuts)

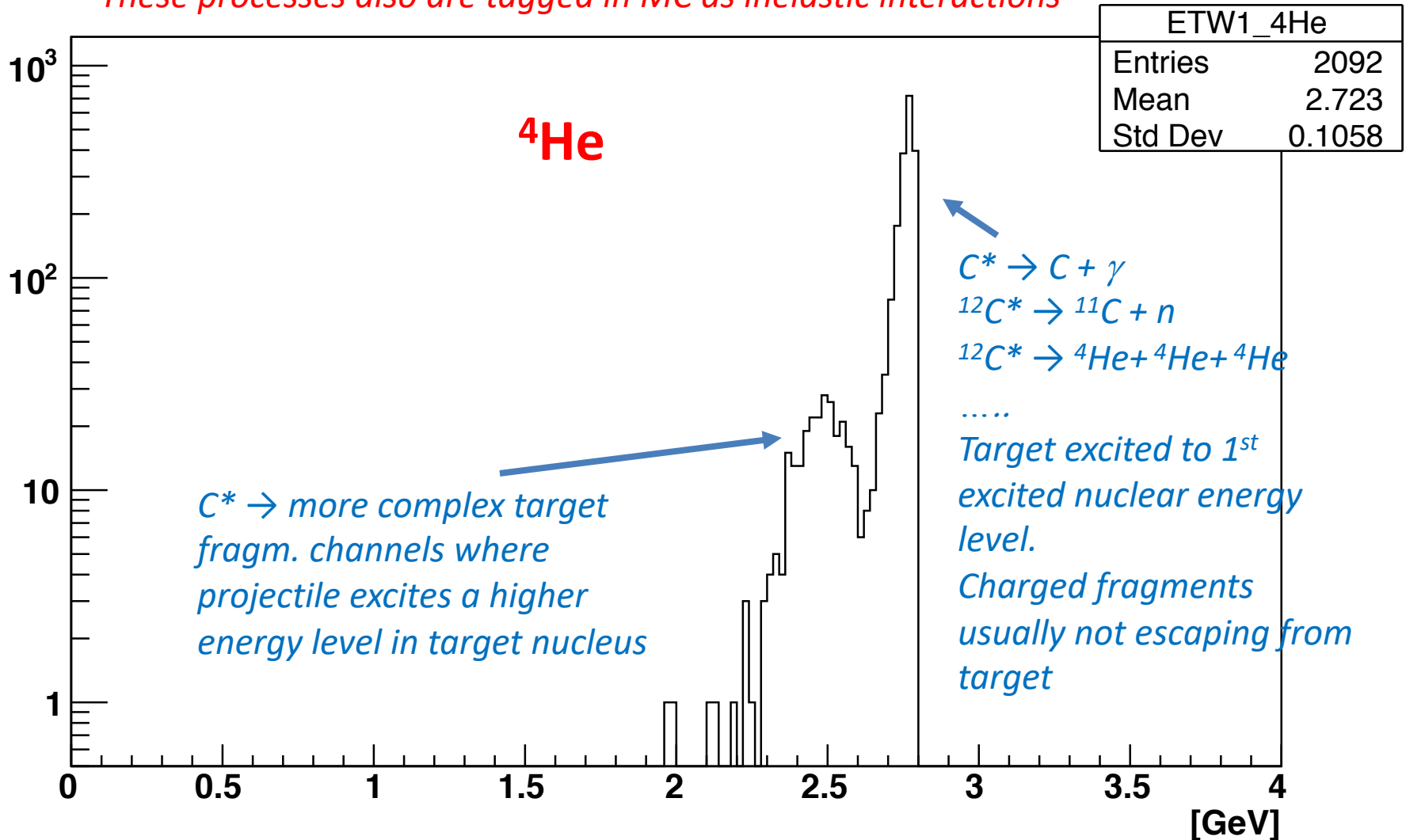


(Total) Energy of secondaries from projectile fragm. arriving at TW

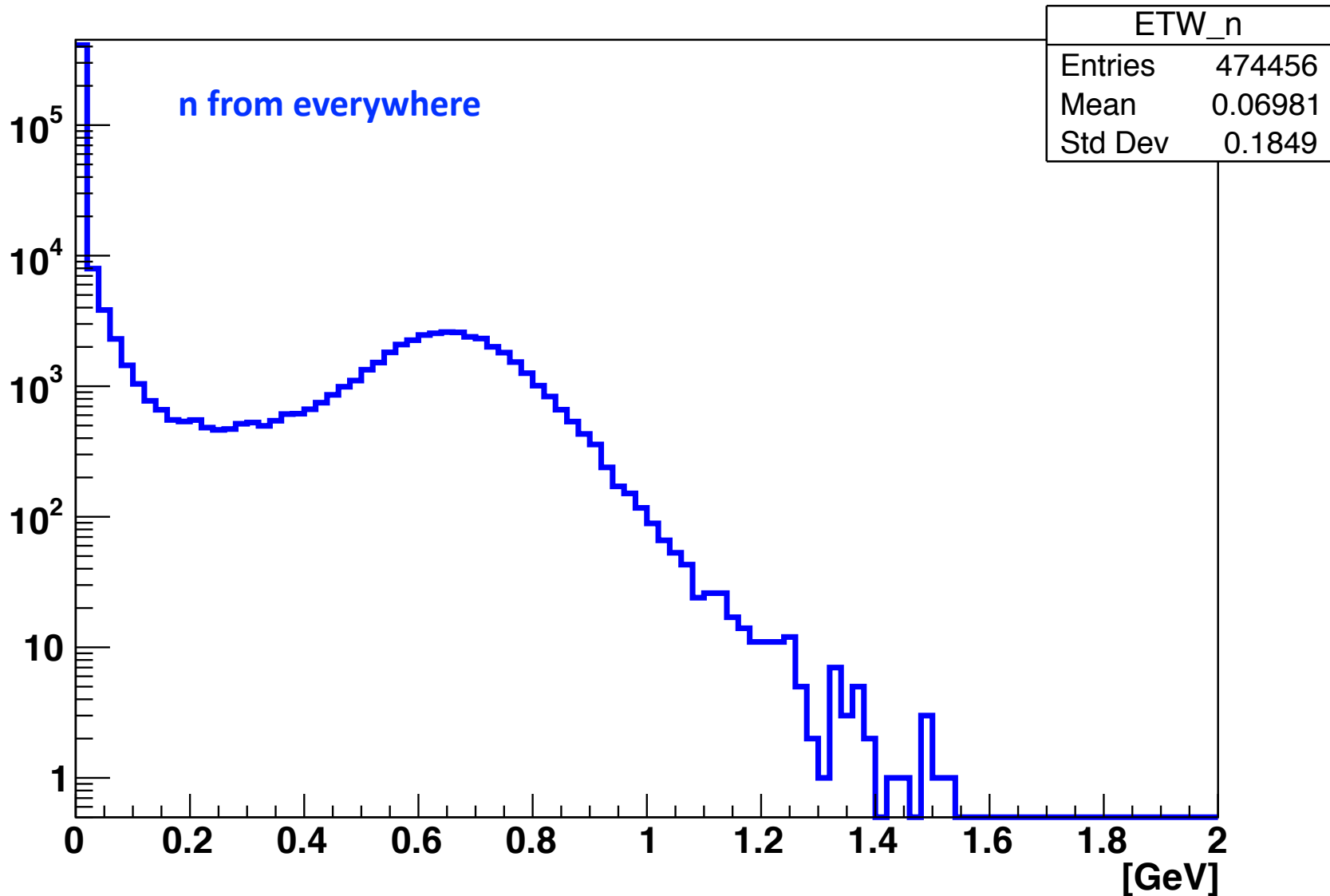


(Total) Energy of secondaries from projectile fragm. arriving at TW - 2

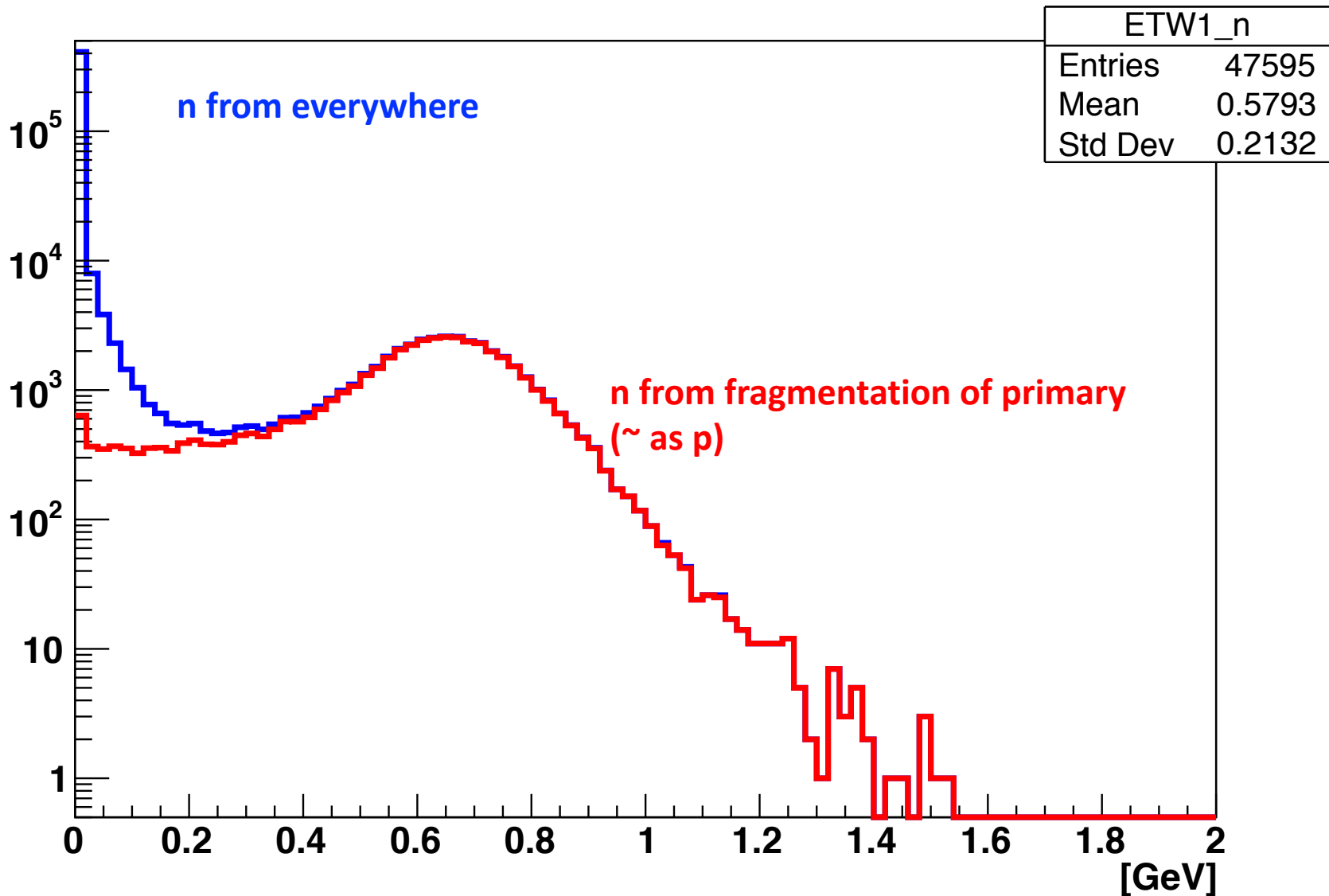
These processes also are tagged in MC as inelastic interactions



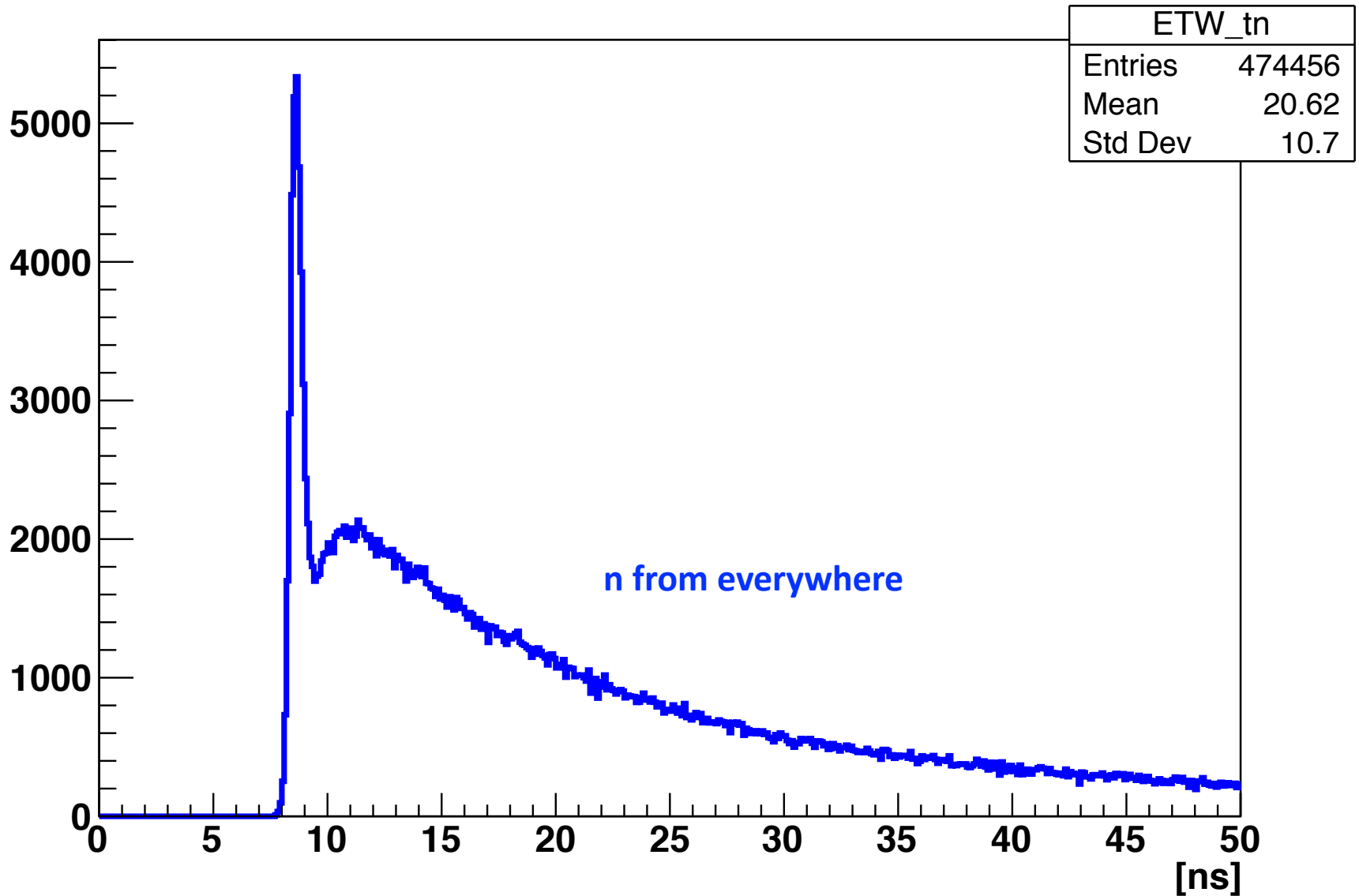
(Total) Energy of secondaries from projectile fragm.: neutrons arriving at TW



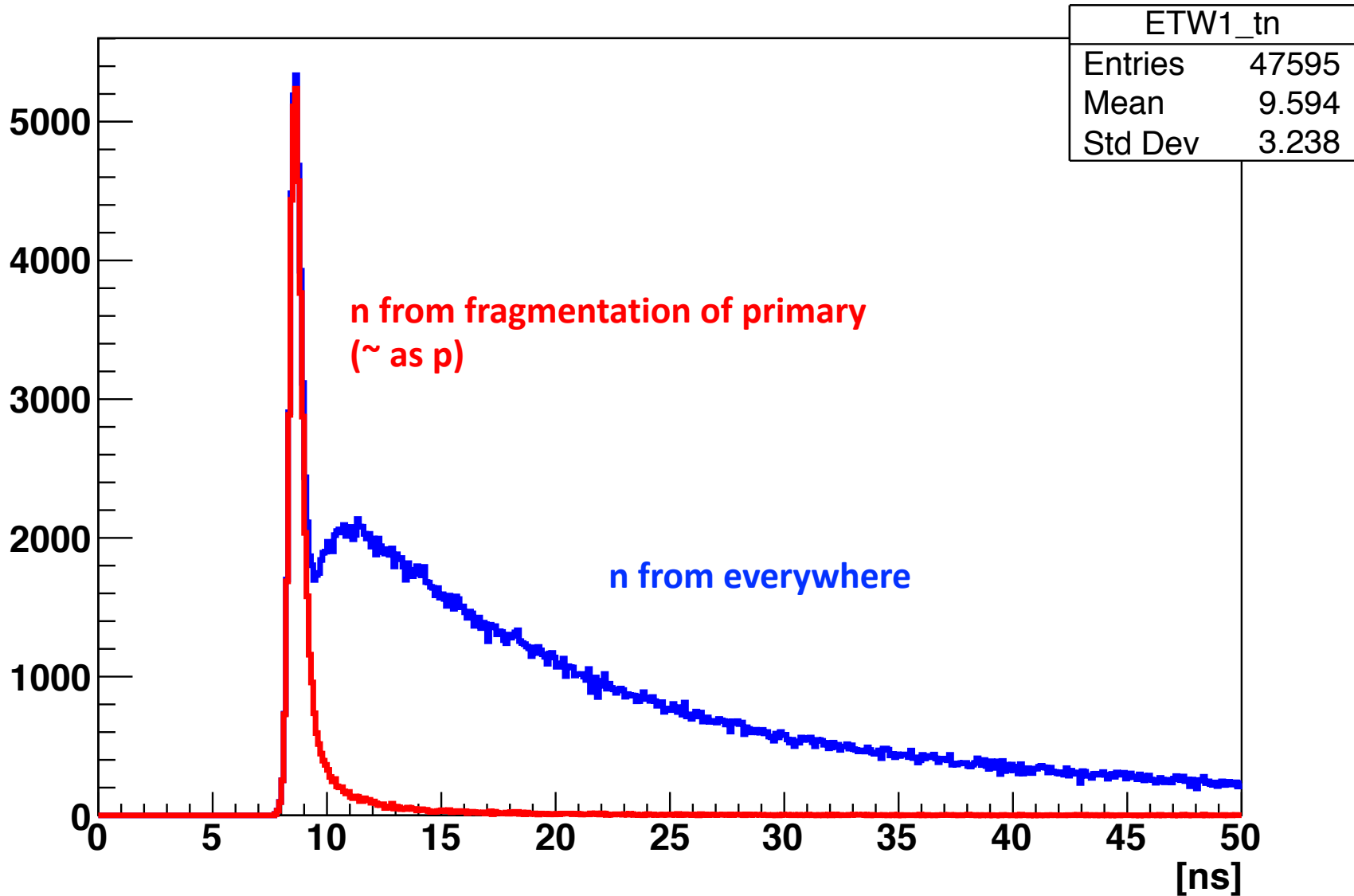
(Total) Energy of secondaries from projectile fragm.: neutrons arriving at TW



Arrival time at TW of neutrons



Arrival time at TW of neutrons



The end