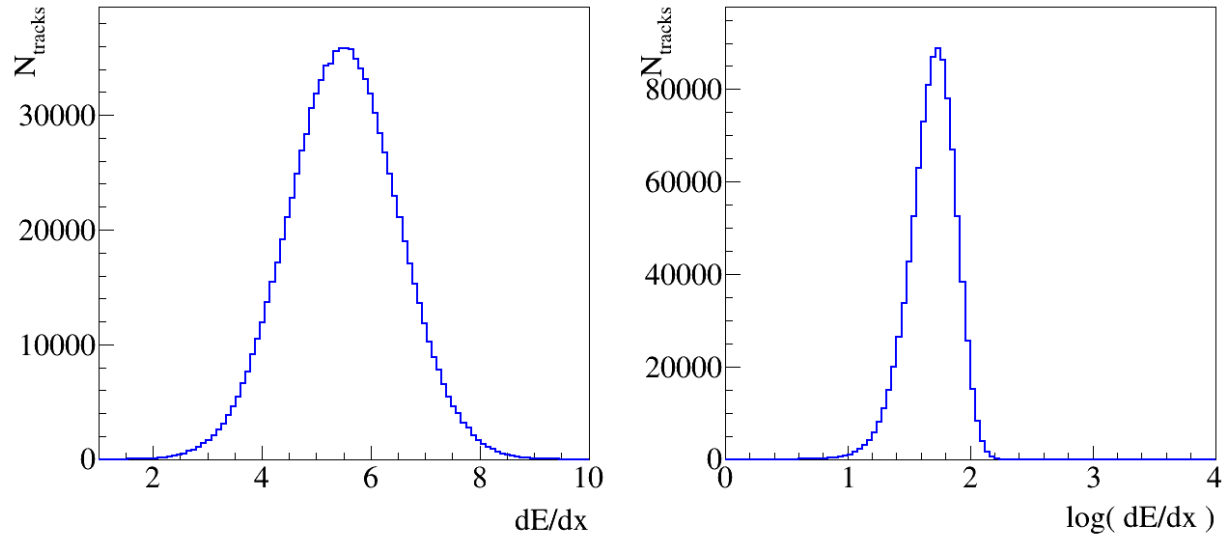


Parameterization of TPC-TOF PID for fragments (evPID wagon)

Aleksandr Mudrokh

evPID wagon: why new simulation was needed

- Existing MpdPid class contains parameterizations of dE/dx value as a function of momentum while new evPID wagon is operating with $\log(dE/dx)$.
- dE/dx distribution and $\log(dE/dx)$ distribution have different shapes.



So, for deuteron, triton, ^3He and ^4He PID a new simulation was generated:

- BOX generator (1 event – 1 track)
- Transport with Geant4
- Vertex smearing: 10 mm along X(Y) axes
- Vertex smearing: 50 cm along Z axis

Primary particles:

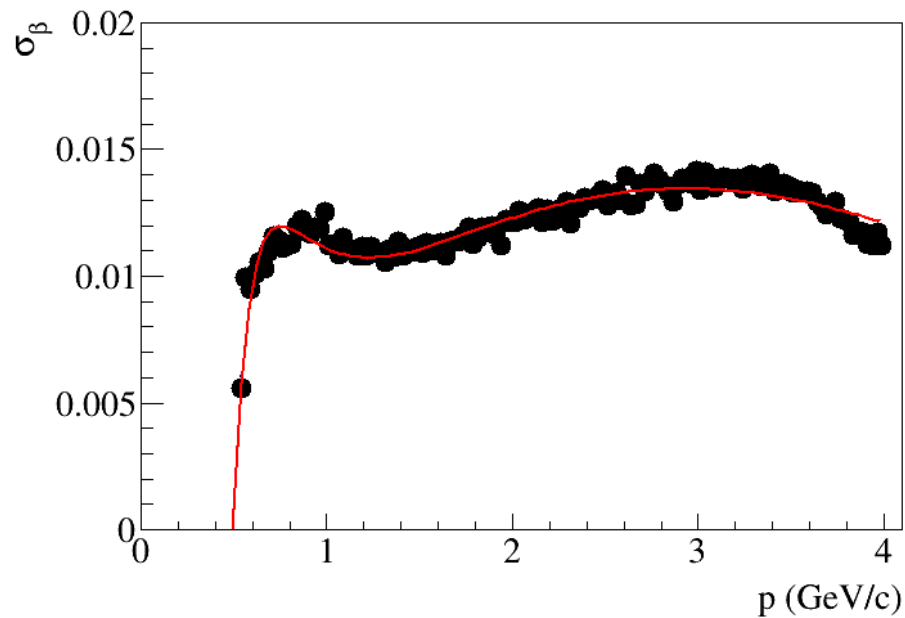
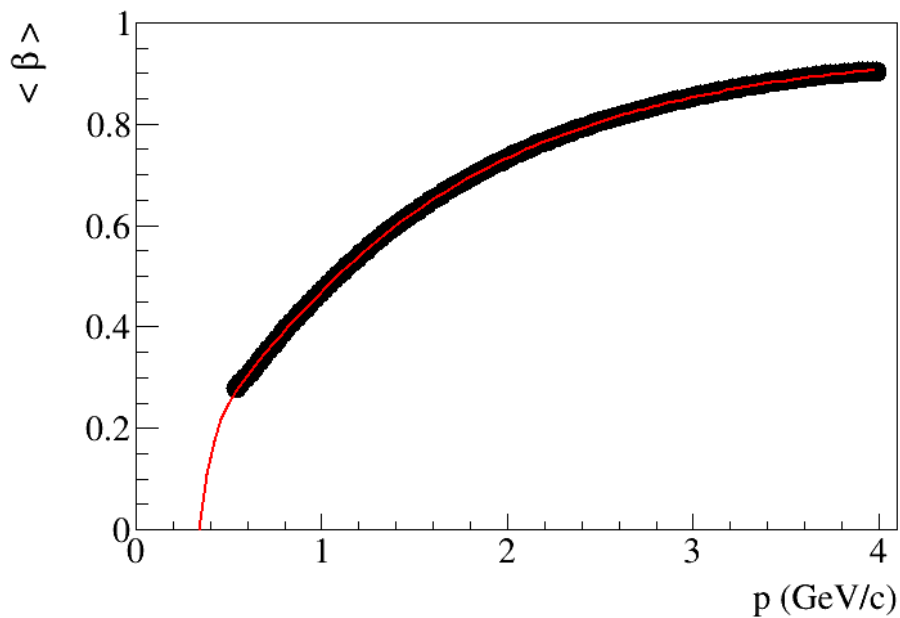
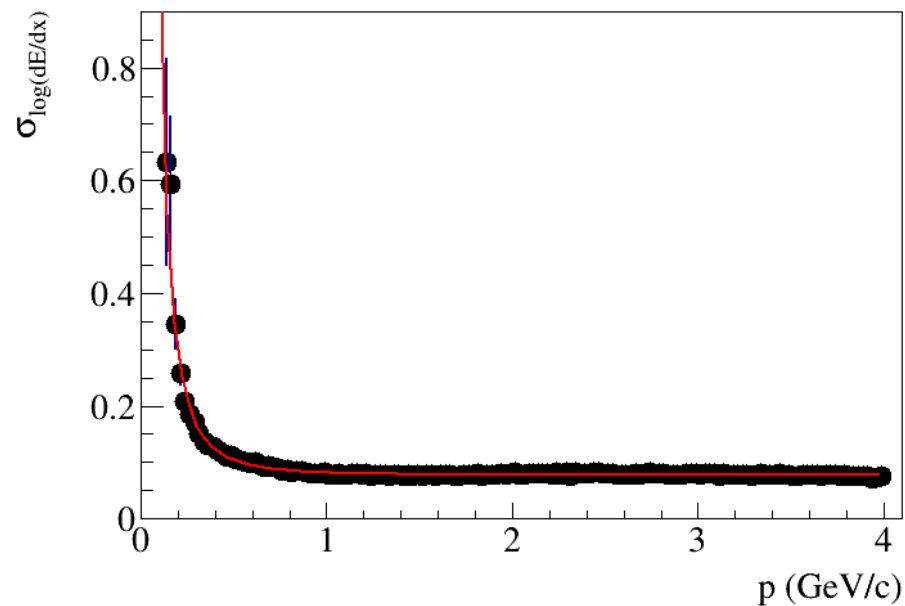
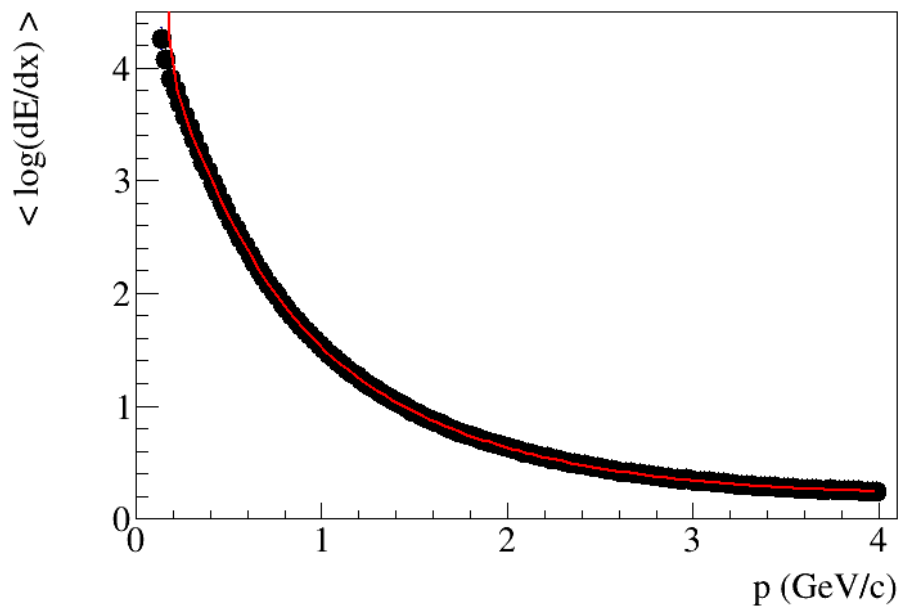
- $0 < p < 4 \text{ GeV}/c$
- $0 < \varphi < 2\pi$
- $0 < \theta < \pi$

Track cuts:

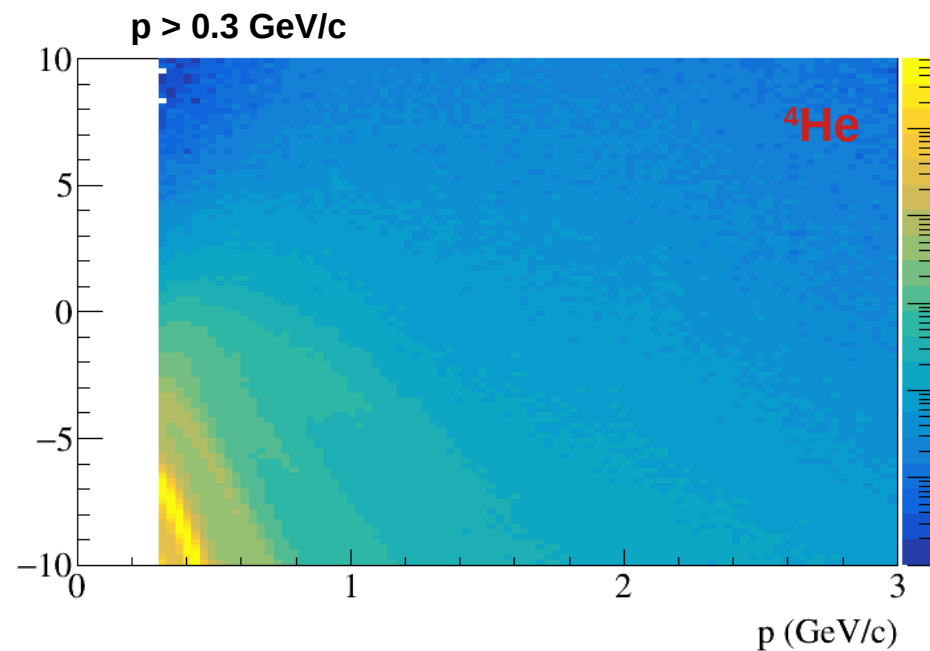
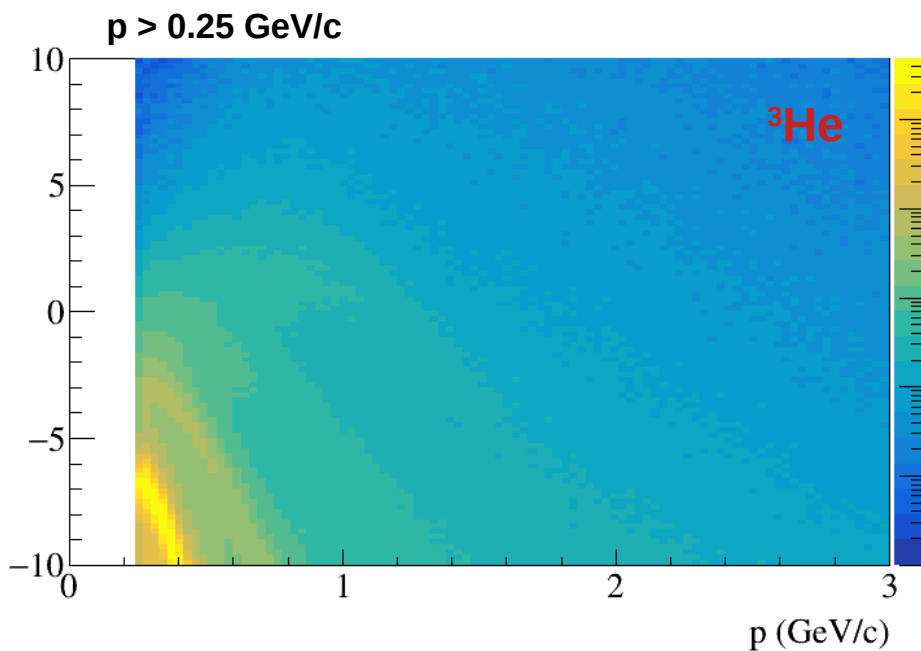
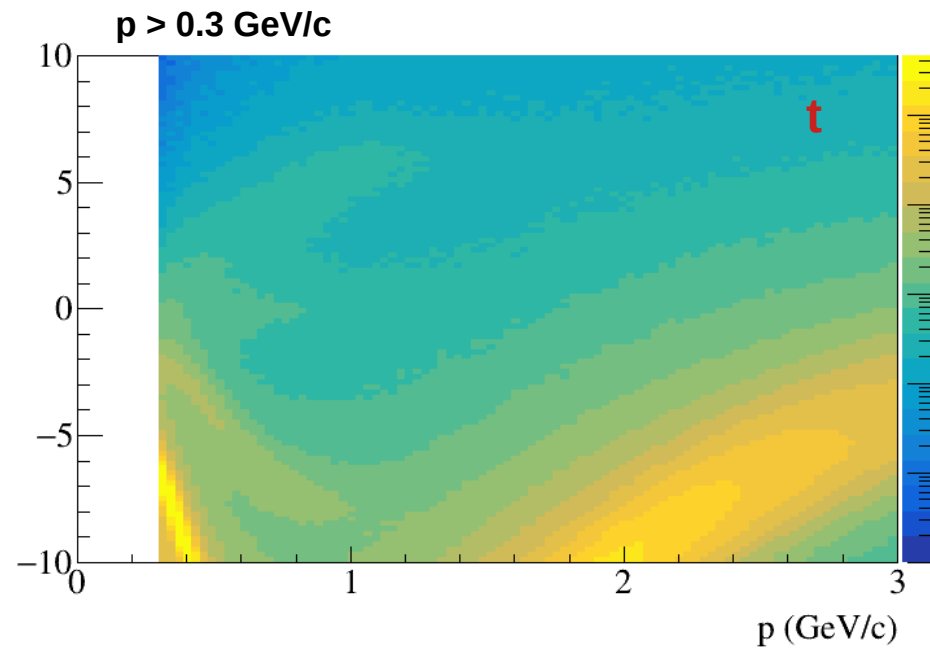
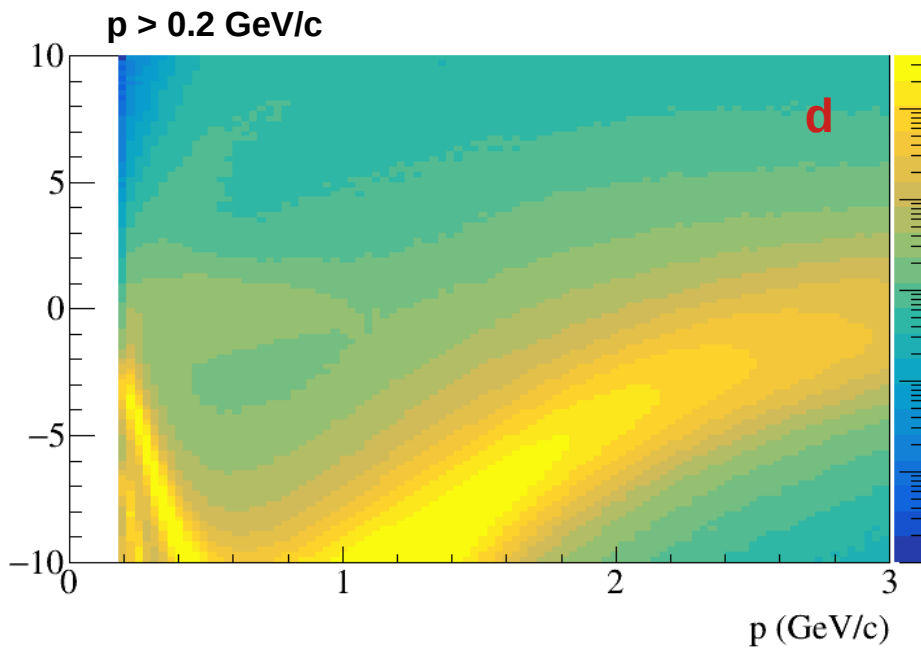
- $n\text{Hits} > 20$
- $|\eta| < 1.3$
- Primary tracks (MC)

evPID update: TPC-TOF parameterizations (deutrons)

$$f(x) = \frac{p_0}{x^2} \times (p_1 \log(x^2) - p_2 x^2 - p_3 x - p_4 - p_5 x^3) + p_6$$



evPID update: $n\sigma$ (dE/dx), request 25 (~1.5M events)



evPID update: $n\sigma$ (TOF beta), request 25 (~1.5M events)

