First observation of hypernuclei in the BM@N

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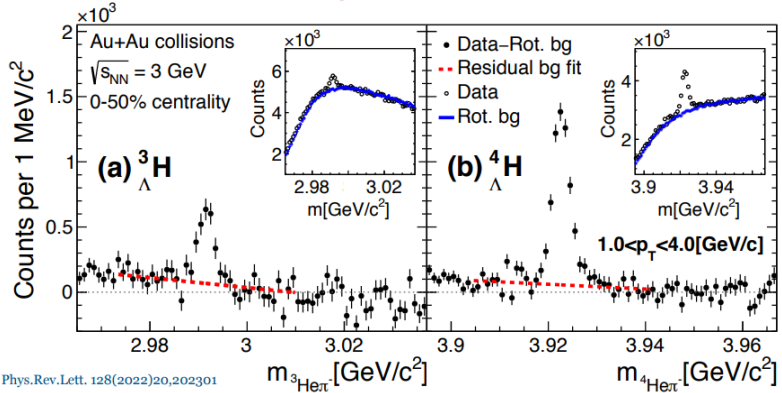
Hypernuclei

- $^3H_\Lambda \longrightarrow {}^3He + \pi^-$
- $^3H_\Lambda \longrightarrow d + p + \pi^-$
- $^4H_\Lambda \longrightarrow {}^4He + \pi^-$
- $^4H_\Lambda \longrightarrow t + p + \pi^-$

STAR



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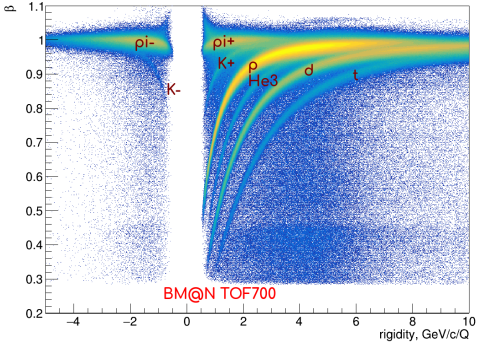
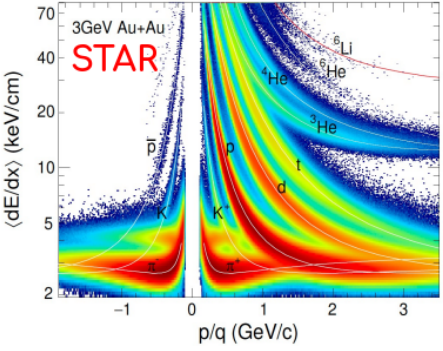
Difficulties of PID in TOF



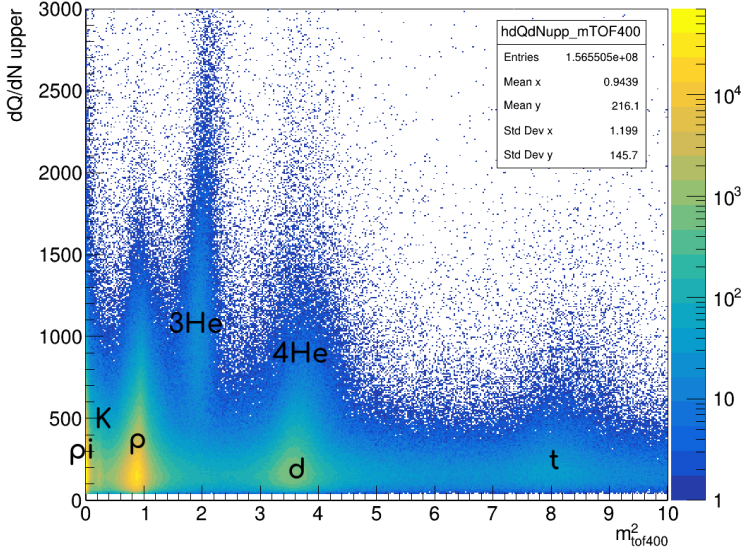


dE/dx in GEM

- It was 7 GEM stations in run 8. Only tracks with 3+ GEM hits were taken into account.
- dE/dx has Landau distribution, so the mean value is shifted by the reason of long "tail".
- The truncated mean was used for analysis (40% hits with maximal signal were removed).

Number of GEM hits	3	4	5	6	7
Used hits	2	2	3	4	4
In percent	67	50	60	67	57

dE/dx vs m^2 in TOF-400

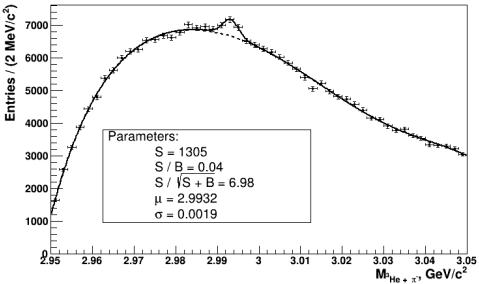


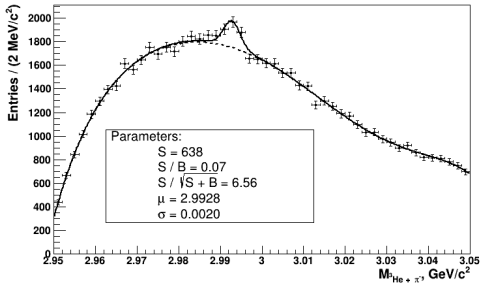
Event and track selection

- Xe + CsI @ 3.8 AGeV
- Statistics: $\approx 3 \cdot 10^8$ events
- MpdVertex: x $\in \{-5; 5\}$cm , y $\in \{-5; 5\}$cm, z $\in \{-1; 1\}$cm
- At lest two tracks in vertex
- Positive track has at least 3 hits in GEM (for dE/dx)

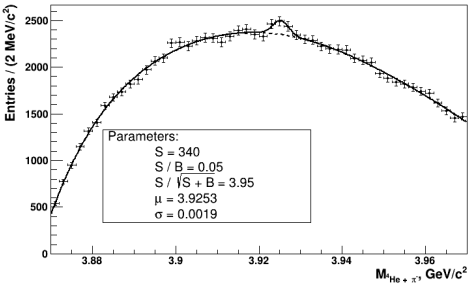
About 8-10 cuts used for signal selection

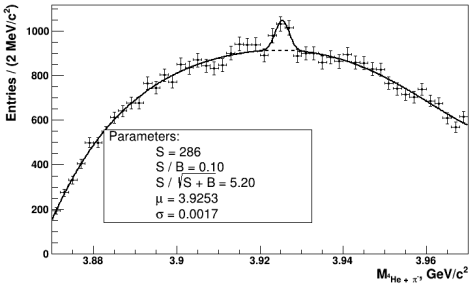
$^3H_\Lambda$ signal





$^4H_\Lambda$ signal





Positive result

- There are stable signals of $^{3}H_{\Lambda}$ and $^{4}H_{\Lambda}$

Signal improvement plans

- New production with better TOF-700 efficiency (factor 2-3)
- More accurate analysis of dE/dx in GEM for the separation of ^{4}He from deuterons
- Standalone matching of STS tracks and TOF hits