

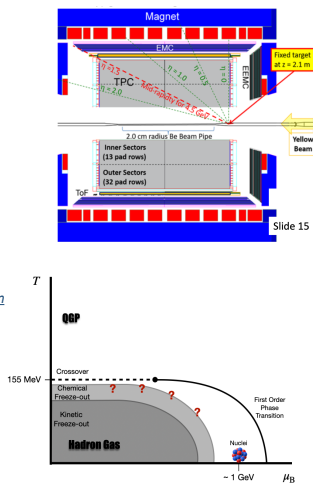


Light-Flavour Hadron Production and Baryon Stopping at High Baryon Density

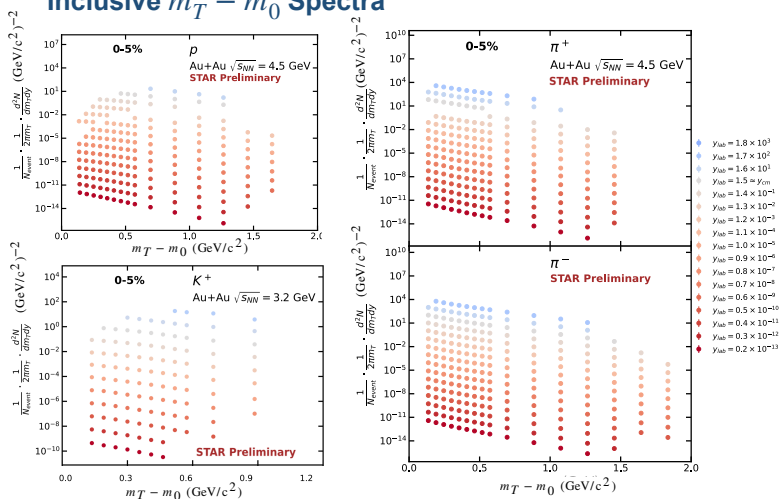
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Introduction

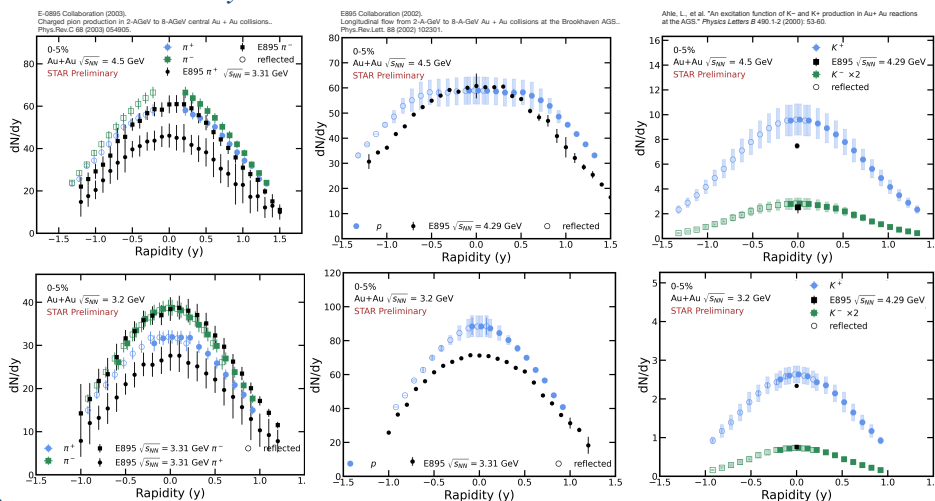
- Light hadron (π , K , p) production measurements can constrain the equation of state of the medium produced in heavy ion collisions.
- Changes in the trends of baryon stopping have been proposed as a signature of a first order phase transition between hadron gas and Quark-Gluon Plasma (Yu B Ivanov, "Alternative scenarios of relativistic heavy-ion collisions. I. Baryon stopping", In: *Physical Review C* **87**, 6 (2013), p. 064904.)
- The Fixed-Target program at STAR allows us to study hadron production in a high baryon density region where the QCD critical point may exist.



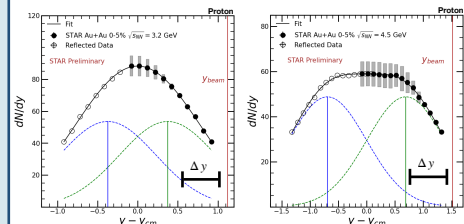
Inclusive $m_T - m_0$ Spectra*



Inclusive dN/dy *

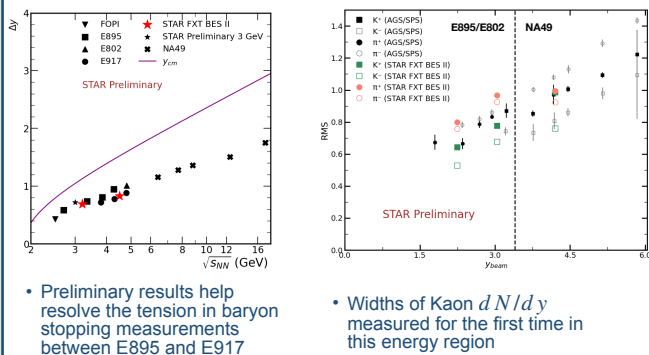


Baryon Stopping



- Δy quantifies how much the protons have shifted away from beam rapidity.
- A first order phase transition is predicted to have a softening of the equation of state, leading to less stopping.
- If the protons have completely shifted to center of mass rapidity, then $\Delta y = 0$.

Results



Summary

- Au+Au collisions analyzed at STAR at $\sqrt{s_{NN}} = 3.2$ and 4.5 GeV.
- Transverse mass spectra and rapidity density distributions for π , k , and p reported.
- Preliminary results show consistency in baryon stopping trend and agree with E895 measurement.
- First measurement of Kaon dN/dy width in this energy region.
- Next Steps:
 - Continue measuring π , K , p spectra in FXT.
 - $\sqrt{s_{NN}} = [3.2, 3.5, 3.9, 4.5, 5.2, 7.2, 7.7]$ GeV.
 - Estimate feed-down contribution from V0-type particles.

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