Strangeness production in U+U $\sqrt{s_{NN}}$ = 193GeV collisions at STAR

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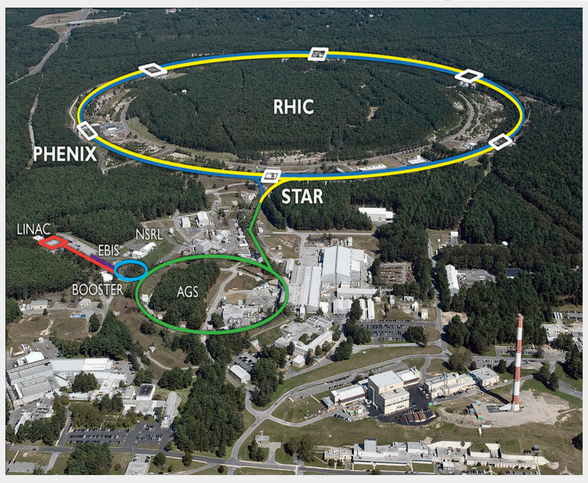
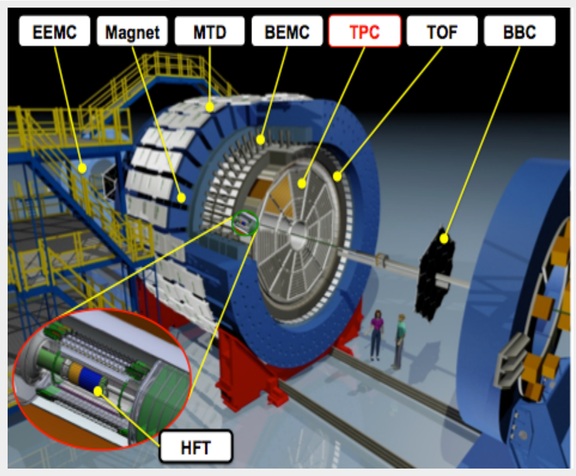
Abstract

Study of strangeness production in heavy-ion collisions can infer properties of deconfined state of quarks & gluons such as baryon to meson enhancement, anti baryon to baryon ratio, nuclear modification factor & strangeness enhancement.
Unlike spherical nuclei like Au or Cu, U have intrinsic prolate deformation shape, which allows U+U collisions to have different geometrical orientation during collision.
Moreover U+U collision can be characterized by larger energy density and larger life time of fireball than Au+Au system [1] .

STAR Experiment at RHIC

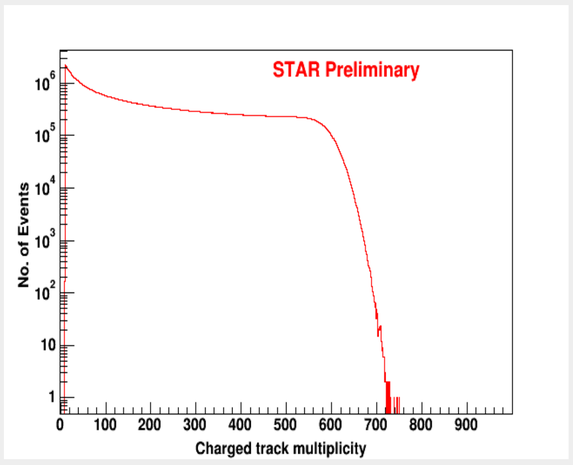


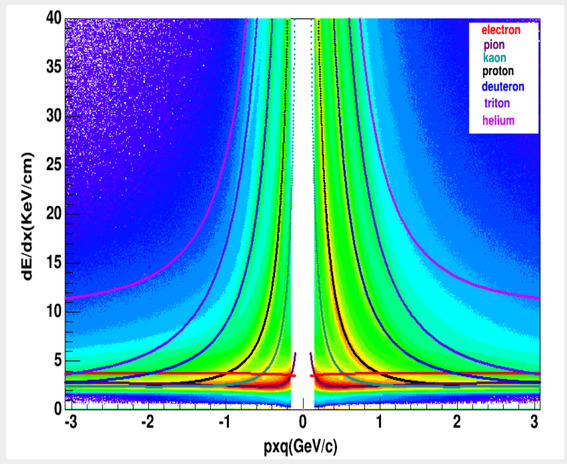


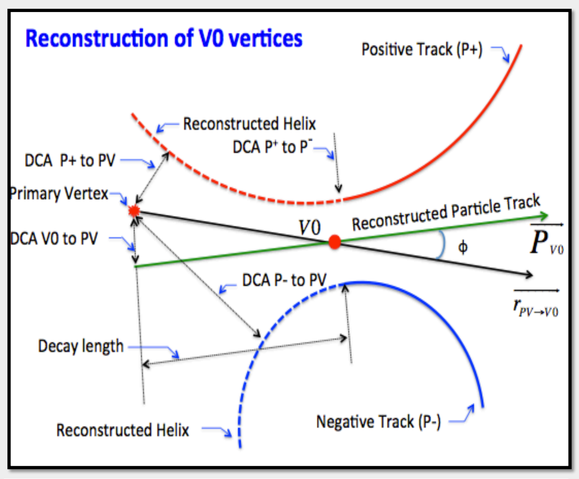
- Colliding systems: Au+Au, Cu+Cu, Cu+Au, **U+U**, d+Au, He+Au, p+p, p+Au, p+Al
- Center of mass energy: $\sqrt{s_{NN}}$ = 7.7GeV to 200GeV
- Magnetic field: 0.5T
- Large acceptance:$|\eta|<1.0$, $0<\phi<2\pi$
- Excellent particle identification capabilities (Using Time Of Fight and Time Projection Chamber)

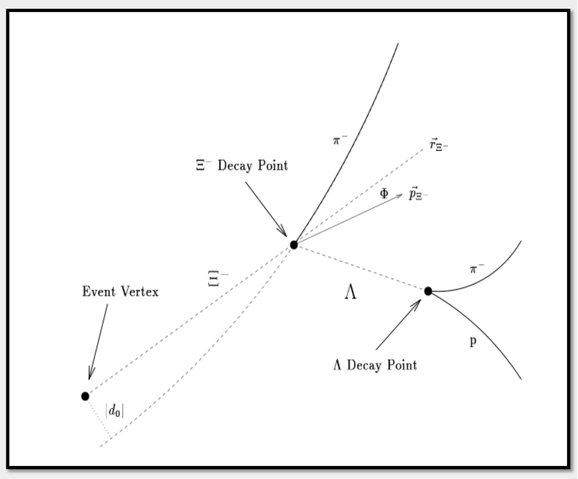
TPC detector is used for this analysis.

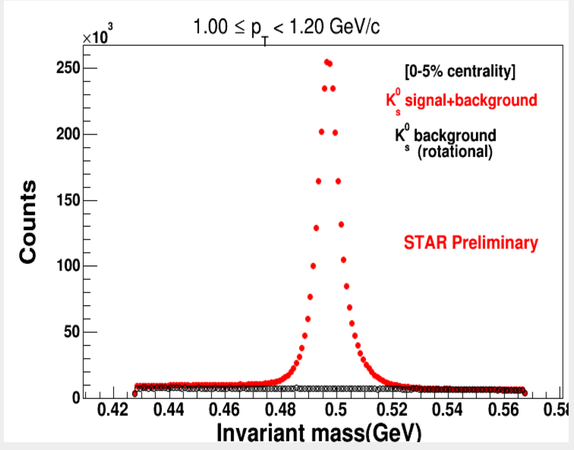
Analysis Technique

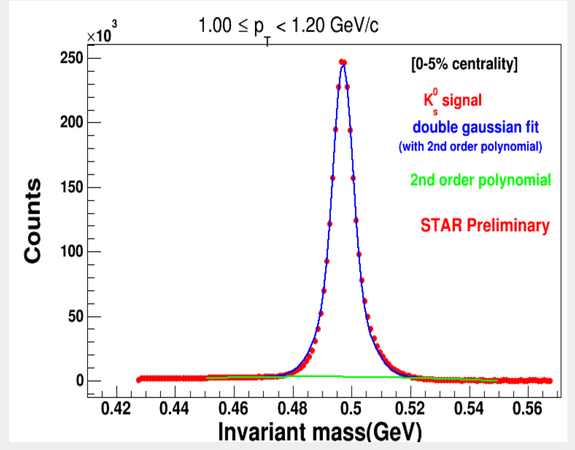




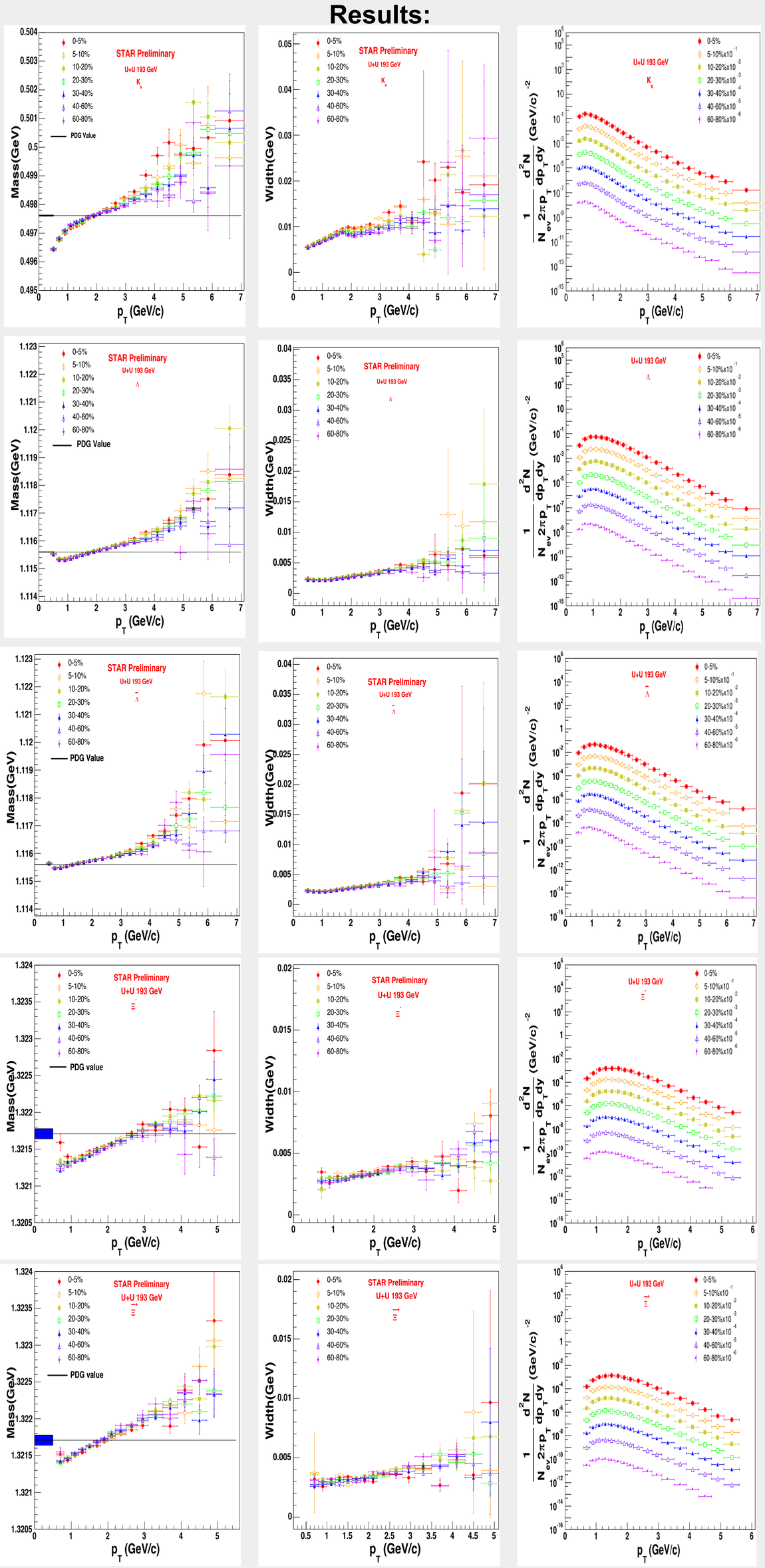








Results:



Efficiency correction yet to be applied. Error bars are statistical only.

Summary & outlook

- ✓ First measurement of strange hadrons(Ks , Λ & Ξ) in U+U $\sqrt{s_{NN}}$ =193 GeV data via their dominant hadronic decay channels.
- ✓ Raw spectra analyzed in 7 different centralities.
- ✓ Measured mass of these particles are consistent with PDG value (less that 1% deviation).
- ✓ To incorporate detector acceptance & efficiency correction.

Reference

[1] D. Kikoa, G. Odyniec, and R. Vogt, Phys. Rev. C 84,054907,(2011)

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