

# Measurement of $\phi$ meson and $\Xi^-$ hyperon production in Au+Au collisions at $\sqrt{s_{\text{NN}}} = 3$ GeV from STAR experiment

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## Abstract

1 The main goal of the STAR experiment is to study the properties of QCD matter  
2 at extreme conditions, high temperature and/or high density, by colliding heavy ions  
3 at ultra-relativistic speed. The yields and particle ratios of strange hadrons provide  
4 important information about the particle production mechanisms in these collisions.  
5 The RHIC Beam Energy Scan program covers a wide range of energies to explore the  
6 transition from a hadronic dominated phase to a partonic dominated one. Of particular  
7 interest is the high baryon density region which is accessible through the STAR fixed-  
8 target program, which has extended the energy reach from  $\sqrt{s_{\text{NN}}} = 7.7$  GeV down to  
9 3.0 GeV.

10 This presentation will report the first measurements of  $\phi$  meson and  $\Xi^-$  hyperon  
11 production in Au+Au collisions at  $\sqrt{s_{\text{NN}}} = 3$  GeV. After correcting for the detector  
12 acceptance and tracking efficiencies, invariant yields and rapidity density distributions  
13 of  $\phi$  and  $\Xi^-$  will be presented. The particle ratios  $\phi/K^-$  and  $\phi/\Xi^-$  will be shown.  
14 Those results will be compared to the thermal and transport model calculations to study  
15 the strangeness production, and particularly to test and constrain canonical ensemble  
16 calculations. Comparisons to measurements from other experiments at similar energies  
17 will also be discussed.