

1  $\phi$ -meson production in Au + Au collisions  
2 at  $\sqrt{s_{\text{NN}}} = 3 \text{ GeV}$  from STAR

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6 The  $\phi$ -meson is the lightest bound state of strange quarks( $s\bar{s}$ ). It has a relatively small  
7 hadronic interaction cross section, therefore  $\phi$ -meson is considered to be a sensitive probe  
8 of the earlier dynamics in the heavy-ion collision. Recent measurements by HADES and  
9 FOPI on subthreshold  $\phi$ -meson production show a larger  $\phi/K^-$  ratio compared to the  
10 results at higher energies[1, 2], and this larger  $\phi/K^-$  ratio cannot be described by thermal  
11 model calculations with Grand Canonical Ensemble for strangeness.

12 In this presentation, we will report on our first measurements of  $\phi$ -meson production  
13 in Au+Au collisions at  $\sqrt{s_{\text{NN}}} = 3 \text{ GeV}$  of energy just above the NN threshold. The data  
14 were taken in 2018 by the STAR experiment with Fixed Target configuration.  $\phi$ -mesons  
15 are measured through their hadronic decay channel,  $\phi \rightarrow K^- + K^+$ . After being corrected  
16 for the detector acceptance and tracking efficiencies, invariant yields and directed flow of  
17  $\phi$ -mesons as well as  $\phi/K^-$  ratio are presented in several centrality intervals and the results  
will be compared to model calculations.

## 18 References

- 19 [1] J. Adamczewski-Musch *et al.* (HADES Collaboration), Phys. Let. **B 778**, (2018)  
20 403-407.
- 21 [2] P. Gasik *et al.* (FOPI Collaboration), Eur. Phys. J. **A 52**, (2016) 177.