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The φ meson production from small to large systems

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The measurement of φ meson production is a unique tool to explore the characteristics of the quark-gluon plasma (QGP). The φ meson has a small interaction cross section and longer lifetime than the QGP, therefore its yields and elliptic flow are good probes of QGP properties. The φ meson production might be sensitive to the strangeness enhancement in the QGP and can provide information about the flavor dependence of energy loss and elliptic flow. Measurements in different nucleus-nucleus collisions allow us to perform a systematic investigation of the nuclear matter effects, system size and geometry influence on φ meson production.

The PHENIX experiment has measured transverse momentum spectra, nuclear modification factors R_{AB} , and elliptic anisotropy parameter v_2 for φ mesons in $+Al$, $^{13}He/Cu+Au$ collisions at $\sqrt{s_{NN}} = 200$ GeV and in U+U collisions at $\sqrt{s_{NN}} = 193$ GeV at midrapidity ($|\eta| < 0.35$). The obtained results exhibit scaling of v_2 for φ mesons with eccentricity of participant nucleons (collision geometry), whereas the φ R_{AB} values depend on the number of binary nucleon-nucleon collisions (system size). The comparison of experimental data on the φ meson to various model calculations (AMPT, iEBE-VISHNU and Pythia 8) suggests importance of viscous hydrodynamics and the coalescence mechanism in describing the properties and hadronization of the QGP.

Is this abstract from experiment?

Yes

Name of experiment and experimental site

PHENIX

Is the speaker for that presentation defined?

Yes

Details

Mr. Iurii Mitrakov, Peter the Great St.Petersburg Polytechnic University (SPbPU), Russia, <https://english.spbstu.ru/>

Internet talk

Yes

Primary author: Mr MITRANKOV, Iurii (Peter the Great St.Petersburg Polytechnic University (SPbPU))

Co-authors: Dr BERDNIKOV, Alexander (Peter the Great St.Petersburg Polytechnic University (SPbPU)); Prof. BERDNIKOV, Yaroslav (Peter the Great St.Petersburg Polytechnic University (SPbPU)); Dr KOTOV, Dmitry (Peter the Great St.Petersburg Polytechnic University (SPbPU)); Mrs MITRANKOVA, Mariia (Peter the Great St.Petersburg Polytechnic University (SPbPU))

Presenter: Mr MITRANKOV, Iurii (Peter the Great St.Petersburg Polytechnic University (SPbPU))

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