Contribution ID: **32** Type: **Oral**

Towards understanding of enhanced production of strange particles in nucleus-nucleus interactions at high energies

Thursday 3 July 2025 15:40 (20 minutes)

Recently, the NA61/SHINE collaboration published experimental data on the production of $\pi^{\pm}$ and $K^{\pm}$ mesons in central $^{40}\mathrm{Ar} + {}^{45}\mathrm{Sc}$ interactions at variouse energies. The collaboration compared its results with calculations of the theoretical Monte Carlo models – EPOS 1.99, PHSD 4.1 and SMASH 2.1.4. It turned out that none of these models reproduces the data in full. All models significantly underestimate the yields of K^{+} and K^{-} mesons by a factor of ~ 2. In this paper, an attempt is made to describe the yields of K^{+} and K^{-} mesons within the framework of the quark-gluon string model implemented in the DCM program – Dubna Cascade Model. According to this model, strings formed between the "sea" quarks and antiquarks of colliding nucleons should be dominated in central nucleus-nucleus interactions . To achieve an agreement with the experimental data, it is necessary to assume that strange quarks and antiquarks dominate among the "sea" quarks and antiquarks. The probability of finding a pair of strange quark – strange antiquark is 72 \%! This value seems unrealistic. It may be related to an incorrect implementation of the quark-gluon string model in the DCM. It is of interest to obtain the corresponding predictions of the modern EPOS and QGSJET models.

Primary author: UZHINSKY, Vladimir (LIT JINR)

Co-authors: Dr GALOYAN, Aida (VBLHEP JINR); Mr CHALYI, Nikita (National Research Tomsk State University)

Presenter: UZHINSKY, Vladimir (LIT JINR)

Session Classification: 4. Relativistic nuclear physics, high-energy and elementary particle physics: Theory

Track Classification: Section 4. Relativistic nuclear physics, high-energy and elementary particle physics.