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K^*/K ratio and the time between freeze-outs for intermediate-mass Ar+Sc system at the SPS energy range

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NA61/SHINE is a multipurpose, fixed-target experiment located at the CERN Super Proton Synchrotron (SPS). The main goal of its strong interaction program is to study the properties of the onset of deconfinement and search for the critical point.

Resonance production is one of the key observables to study the dynamics of high-energy collisions. In dense systems created in heavy nucleus-nucleus collisions, the properties of some of them (widths, masses, branching ratios) were predicted to be modified due to partial restoration of chiral symmetry. The resonance spectra and yields are also important inputs for Blast-Wave and Hadron Resonance Gas models. Finally, the analysis of strange $K^*(892)^0$ resonance allows to better understand the time evolution of high-energy nucleus-nucleus collision. Namely, the ratio of $K^*(892)^0$ to charged kaons is used to determine the time between chemical and kinetic freeze-outs.

In this talk, the first results of the analysis of $K^*(892)^0$ production in central Ar+Sc collisions at three SPS energies ($\sqrt{s_{NN}} = 8.8, 11.9, 16.8$ GeV) will be presented. The $K^*(892)^0/K^{+/-}$ yield ratios will be compared with corresponding results in p+p collisions, allowing to estimate the time between kinetic and thermal freeze-outs for Ar+Sc collisions. These first results for intermediate-mass nucleus-nucleus systems at the SPS energy range will be compared with the results of heavier systems at a similar energy range.

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