

Mesons in NA61/SHINE

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Collaboration

NA61/SHINE

Abstract content

The NA61/SHINE experiment at the CERN SPS pursues a two-fold physics programme: (1) measurements of hadron spectra in hadron-nucleus collisions for neutrino and cosmic rays experiments; and (2) study of strongly interacting matter via a two-dimensional beam momentum and system size scan, including correlations, fluctuations and hadron spectra. This contribution presents recent results on meson production from both parts of the programme, which provide important input to tune hadron production models.

The results include spectra of π^+ , π^- and K^+ , K^- mesons in $p + p$, $p+C$, Be+Be and Ar+Sc collisions at 5 beam momenta per nucleon from 20 to 158 GeV/c. They are compared with predictions of several models, none of which gives a satisfactory description of the data in all phase space regions. In particular, a surprising system size dependence of K/π ratio is observed, that cannot be described by any model.

Furthermore, spectra of ϕ mesons in $p + p$ collisions at 40, 80 and 158 GeV/c, K_S^0 in p+C at 31 GeV/c, as well as ρ^0 , ω and K^{*0} in $\pi^- + C$ at 158 GeV/c and 350 GeV/c are presented. A spectacular failure of considered models is observed for ϕ , ρ^0 and K^{*0} production. Also, a very peculiar system size dependence of the longitudinal evolution of ϕ production, contrasting with all other measured hadrons, is shown.

Finally, preliminary results on spectator-induced electromagnetic effects in π^+ , π^- production in Ar+Sc at 150A GeV/c are presented, bringing information on space-time evolution of the hot and dense matter created in the collision.

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