

A new mechanism for the phi meson production

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Data on the production of phi meson in nuclear collisions at the AGS and SPS energies are hard to explain with hadronic mechanisms involving reactions of pions and nucleons. Reactions involving these most abundant species are rare owing to the OZI-suppressed cross sections. We argue that reactions of pions on hyperons which lead to production of phi and hyperon, as well as antikaons on nucleons which produce phi and hyperon can have bigger cross sections by factors of 50 and 60, respectively. This makes them to relevant processes of phi meson production in spite of the small density of strange hadrons in the fireball. We show that these catalytic reactions can be operative if the maximum temperature in the fireball is at least 130 MeV and the lifespan of the fireball is not below 10 fm/c. We discuss the possible influence of catalytic reactions on phi yields at the AGS energies and phi rapidity distributions at the CERN SPS.