

Meson Production at SPS Energies

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Strange and non-strange meson production in proton-proton, proton-Pb, and Pb-Pb collisions at beam energies of 158 GeV per nucleon has been measured at the CERN SPS accelerator. The measurements include the central (“mid-rapidity”) area of the reaction and extend far into the projectile fragmentation region, providing full double-differential coverage for $0 < x_F^* < 0.9$ and $0 < p_T < 2$ GeV/c.

A comparative analysis of the above elementary and nuclear collisions reveals differences as well as similarities. The heavy ion collision appears as a mixture of high energy hadronic processes (proton-proton physics, multiple collisions, etc), as well as of phenomena specific to the lower energy nuclear domain (nuclear excitations, final state Coulomb interactions). This results in surprising effects, like the presence of large and strongly varying structures in the shape of the double-differential cross-section $\frac{d^2\sigma}{dx_F dp_T}$, particle ratios, and others.

The importance of low energy nuclear physics for the understanding of high-energy reactions will be emphasized.

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