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Stopping in ultrarelativistic nuclear collisions - results from NA49

It is now generally accepted that heavy ion collisions at ultra relativistic energies result in a fireball of matter with high density and temperature. Such conditions prevail, when the incoming nucleons deposit enough of their kinetic energy in the reaction zone. Little is known about this stopping process and about possible differences between the stopping of the incident nucleons in elementary nucleon-nucleon interactions and nucleus-nucleus collisions. The longitudinal momentum of the net baryons after the collision is a suitable observable to characterize the energy loss (stopping) of the incident nucleons. In this contribution we present a systematic study of the rapidity distributions of net protons and Lambda hyperons as function of centrality in Pb+Pb collisions at 158 and 40 GeV per nucleon incident energy. The experimental nuclear collision data are compared to data from elementary nucleon-nucleon interactions, to results of microscopic transport model calculations, and to expectations from a core-corona picture in which the reaction zone consists of a hot and thermalized core (central fireball) and a corona with characteristics given by elementary nucleon-nucleon interactions.

Primary author: Dr KOWALSKI, Marek (Institute of Nuclear Physics, Cracow, Poland)

Presenter: Dr KOWALSKI, Marek (Institute of Nuclear Physics, Cracow, Poland)

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