The Spectator-Induced Electromagnetic Effect on Meson Production in Nucleus-Nucleus Collisions at SPS Energies.

Iwona Sputowska[(a)], Andrzej Rybicki[(a)],

[(a)] The Henryk Niewodniczański Institute of Nuclear Physics, Polish Academy of Sciences, ul. Radzikowskiego 152, 31-342 Kraków, Poland

The electromagnetic interaction between the spectator system and the charged mesons produced in the course of the high energy heavy ion collision was studied experimentally and theoretically in earlier works [1,2]. This effect was found to result in very large distortions of the final state spectra of the produced mesons [3] and to bring new information on the space-time evolution of the non-perturbative meson production process [4].

In this paper a more extended analysis of this effect will be presented, including a comparative study between charged meson spectra produced in Pb+Pb collisions as well as collisions of Pb ions with smaller nuclei. The experimental results will be compared with Monte Carlo simulations, giving a fair overall understanding of the interplay between the strong and the electromagnetic interaction in the heavy ion collision. A universal behaviour of charged meson spectra emerges from the above comparative study. This gives a unique chance of using the spectator charge as a tool to study the space-time evolution of the high energy nucleus-nucleus reaction.

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[3] A.Rybicki, PoS(EPS-HEP 2009) 031,

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E-mail: iwona.sputowska@cern.ch