

Fire-streaks, electromagnetic effects, directed flow and lifetime of the plasma at SPS energies

Wednesday 29 July 2020 17:30 (24 minutes)

We present our calculation [1] of electromagnetic effects, induced by the spectator charge on Feynman- x_F distributions of charged pions in peripheral $Pb+Pb$ collisions at CERN SPS energies, including realistic initial space-time-momentum conditions for pion emission. The calculation is performed in the framework of the fire-streak model, adopted to the production of both π^- and π^+ mesons. Isospin effects are included to take into account the asymmetry in production of π^+ and π^- at high rapidity. A comparison to a simplified model from the literature is made. We obtain a good description of the NA49 data on the x_F - and p_T -dependence of the ratio of cross sections π^+/π^- . The experimental data favors short times ($0.5 < \tau < 2$ fm/c) for fast pion creation in the local fire-streak rest frame. The possibility of the expansion of the spectators is considered in our calculation, and its influence on the electromagnetic effect observed for the π^+/π^- ratio is discussed. We conclude that the fire-streak model, which properly describes the centrality dependence of π^- rapidity spectra at CERN SPS energies, also provides realistic initial conditions for pion production. Consequently, it provides a quantitative description of the electromagnetic effect on the π^+/π^- ratio as a function of x_F .

We shall discuss also charge splitting of the directed flow of pions for RHIC beam energy scan data in the same phenomenological approach [2].

[1] V. Ozvenchuk, A. Rybicki, A. Szczurek, A. Marcinek, M. Kielbowicz, arXiv:1910.04544.

[2] V. Ozvenchuk et al, a paper in preparation.

I read the instructions

Secondary track (number)

Primary authors: SZCZUREK, Antoni (Institute of Nuclear Physics); RYBICKI, Andrzej (Polish Academy of Sciences (PL)); Dr OZVENCHUK, Vitalii (IFJ PAN)

Presenter: Dr OZVENCHUK, Vitalii (IFJ PAN)

Session Classification: Heavy Ions

Track Classification: 07. Heavy Ions