



The VIth International Conference on the
INITIAL STAGES
 OF HIGH-ENERGY NUCLEAR
 COLLISIONS



Contribution ID: 145

Type: **bullet talk (poster)**

Spectator induced electromagnetic effects in heavy-ion collisions and space-time-momentum conditions for pion emission

Sunday 10 January 2021 19:45 (1h 30m)

We present our calculation 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 our simplified implementation of the fire-streak model, adapted 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 simpler 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. In addition we discuss the relation between anisotropic flow and the electromagnetic distortion of π^+/π^- ratios, and study the influence of transverse expansion of fire streaks as well as their vorticity on this distortion. In this latter study we find that inclusion of rotation of fire streaks in our model gives a satisfactory description of the rapidity dependence of pion directed flow. We conclude that our implementation of the fire-streak model, which properly describes the centrality dependence of π^- rapidity spectra at CERN SPS energies, also provides a quantitative description of the electromagnetic effect on the π^+/π^- ratio as a function of x_F .

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

Presenters: Dr OZVENCHUK, Vitalii (IFJ PAN); OZVENCHUK, Vitalii (IFJ PAN)

Session Classification: Poster

Track Classification: New theoretical techniques at large and small coupling