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Spectator charge splitting of directed flow in heavy ion collisions

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We estimate the electromagnetic effect of the spectator charge on azimuthal anisotropies observed in heavy ion collisions. For peripheral Pb+Pb reactions at the top energy of the CERN Super Proton Synchrotron, $\sqrt{s_{NN}} = 17.3$ GeV, we predict this effect to bring very large distortions to the observed directed flow, v_1 , of positive and negative pions emitted close to beam rapidity. The overall magnitude of this effect is comparable to values of v_1 reported by the WA98 experiment. We argue that also at lower rapidities, the spectator induced electromagnetic effect may result in the splitting of values of v_1 observed for positive and negative pions. Such a splitting is visible also in the data reported by the STAR Collaboration from the RHIC Beam Energy Scan. Both effects are sensitive to the space-time scenario assumed for pion emission. Therefore, the electromagnetic splitting brings new information on the collision dynamics. The presentation will be based on our recent preprint [1].

1) A. Rybicki and A. Szczurek, arXiv:1303.7354, submitted to Phys. Rev. C.

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