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Estimation of electric conductivity of the quark gluon plasma via asymmetric heavy-ion collisions

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We show that in asymmetric heavy-ion collisions, especially off-central Cu+Au collisions, a sizable strength of electric field directed from Au nucleus to Cu nucleus is generated in the overlapping region, because of the difference in the number of electric charges between the two nuclei. This electric field would induce an electric current in the matter created after the collision, which result in a dipole deformation of the charge distribution. The directed flow parameters v_1^\pm of charged particles turn out to be sensitive to the charge dipole and provide us with information about electric conductivity of the quark gluon plasma.

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