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Event-by-event generation of electromagnetic fields in heavy-ion collisions

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We compute the electromagnetic fields generated in heavy-ion collisions by using the HIJING model. Although after averaging over many events only the magnetic field perpendicular to the reaction plane is sizable, we find very strong electric and magnetic fields both parallel and perpendicular to the reaction plane on the event-by-event basis. We study the time evolution and the spatial distribution of these fields. In particular, the electromagnetic response of the quark-gluon plasma can give nontrivial evolution of the electromagnetic fields.

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