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Mach Cone Induced by γ-Triggered Jets in High-Energy Heavy-Ion Collisions

Medium excitation by jet shower propagation inside a quark-gluon plasma is studied within a linear Boltzmann transport and a multiphase transport model. Contrary to the naive expectation, it is the deflection of both the jet shower and the Mach-cone-like excitation in an expanding medium that is found to give rise to a double-peak azimuthal particle distribution with respect to the initial jet direction. Such a deflection is the strongest for hadron-triggered jets which are often produced close to the surface of a dense medium due to trigger bias and travel against or tangential to the radial flow. Without such trigger bias, the effect of deflection on γ-jet showers and their medium excitation is weaker. Comparative study of hadron and γ-triggered particle correlations can therefore reveal the dynamics of jet-induced medium excitation in high-energy heavy-ion collisions.

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