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Minijet quenching in a concurrent jet+hydro evolution and the nonequilibrium quark-gluon plasma

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Minijets, created by perturbative hard QCD collisions at moderate energies, can represent a significant portion of the total multiplicity of a heavy-ion collision event. Since their transverse momenta are larger than the typical saturation scale describing the bulk of the equilibrating QGP, they do not in general hydrodynamize at the same pace than the bulk of the collision. In this work we make use of a new concurrent minijet+hydrodynamic framework in which the properties of the fluid QGP are modified due to the injection of energy and momentum from the minijets. In order to achieve a realistic description of charged particle multiplicity, the amount of entropy associated to the low-x initial state needs to be reduced. Moreover, the fact that the injected momentum from the randomly oriented minijets is not correlated with the spatial gradients of the system reduces overall flow, and the value of the QGP transport coefficients needs to be reduced. They are, in effect, an important new source of fluctuations. We avow that their abundance makes it necessary to include their physics in holistic descriptions of heavy-ion collisions. We discuss the impact of the minijets on a number of observables, such as p_T spectra and p_T-differential flow v_n for a wide range of centrality classes.

Based on: *Minijet quenching in a concurrent jet+hydro evolution and the nonequilibrium quark-gluon plasma*, D. Pablos, M.Singh, C. Gale, S. Jeon. *Phys.Rev.C 106 (2022) 3, 034901*

Experiment/Theory

Theory/Phenomenology

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