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Dijet Acoplanarity as a Probe of the Nonperturbative Color Structure of QCD Perfect Fluids with CUJET3

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Using the CUJET3 framework [1], we predict dijet acoplanarity observables using jet-medium couplings that are χ^2 constrained by global RHIC&LHC R_{AA} data, thereby significantly extending our previous work in [2]. We compare the predicted dijet relative azimuthal angle distributions for jets propagating through both perturbative (wQGP/HTL) and nonperturbative (sQGMP) models of the color structure of QCD perfect fluids as described by the VISHNU viscous hydro framework. Our strategy to discriminate between these pictures of the QGP is based on the different parametric dependence of the jet path energy loss functionals, $\Delta E[x[t]] \propto < \hat{q}L^2 >$; and the width of the dijet azimuthal angle distribution, which is proportional the transverse saturation squared path functional, $Q_s^2[x[t]] \propto < \hat{q}L >$. By constraining $\Delta E[x[t]]$ using inclusive hadron and jet suppression data, the medium-induced dijet acoplanarity is predicted by CUJET3 to be approximately twice as large in sQGMP than in wQGP. Future trigger+jet coincidence measurements at RHIC and LHC will have sufficient precision to resolve this difference on top of the expected large acoplanarity background due to vacuum Sudakov radiation. (refs: [1] S.Shi et al, Chin.Phys. C43 (2019) 044101, [2] M.Gyulassy et al, NPA982(2019)627)

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