

Abstract Submitted
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The Emergence of Hadrons from QCD Color¹ LAMIAA EL FASSI, Mississippi State University, COLOR DYNAMICS IN COLD MATTER (CDCM) COLLABORATION — The formation of hadrons from energetic quarks, the dynamical enforcement of QCD confinement, is not well understood at a fundamental level. In Deep Inelastic Scattering, modifications of the distributions of identified hadrons emerging from nuclei of different sizes reveal a rich variety of spatial and temporal characteristics of the hadronization process, including its dependence on spin, flavor, energy, and hadron mass and structure. The EIC will feature a wide range of kinematics, allowing a complete investigation of medium-induced gluon bremsstrahlung by the propagating quarks, leading to partonic energy loss. This fundamental process, which is also at the heart of jet quenching in heavy ion collisions, can be studied for light and heavy quarks at the EIC through observables quantifying hadron “attenuation” for a variety of hadron species. Transverse momentum broadening of hadrons, which is sensitive to the nuclear gluonic field, will also be accessible, and can be used to test our understanding from pQCD of how this quantity evolves with pathlength, as well as its connection to partonic energy loss. The evolution of the forming hadrons in the medium will shed new light on the dynamical origins of the forces between hadrons, and thus ultimately on the nuclear force.

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William Brooks
Universidad Técnica Federico Santa María

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