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Jet quenching in a multi-stage approach[1] AMIT KUMAR, Wayne State University, JETSCAPE COLLABORATION — In this talk, we present a comprehensive study by performing a model-to-data comparison for leading hadrons, inclusive jets, and jet substructure observables. Using the JETSCAPE framework, we succeed in providing a simultaneous description of the nuclear modification factor for single hadrons and jets, jet shape, and jet fragmentation function within a unified multi-stage framework which spans multiple centralities, energies and jet radii. This multi-scale approach includes a high virtuality (radiation dominated) generator (MATTER), followed by an on-shell energy loss generator (LBT/MARTINI) or a strongly coupled drag energy loss (AdS/CFT) stage. Each stage transitions to the next at a parton-by-parton level, depending on local quantities such as the partons energy, virtuality, and the local density. Measurements of jet and single hadron R_{AA} set strong constraints on the phase-space available for each stage of the energy-loss. We also incorporate jet-medium response through a weakly-coupled transport description with recoil particles excited from the QCD medium. We highlight the central role played by recoil in the description of both integrated jet observables and the sub-structure of the jet.

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