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Jet quenching from RHIC to LHC

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Despite a wealth of experimental data for high p_T processes in heavy-ion collisions, discriminating between different models of hard parton-medium interactions has been difficult. A large reason is that the pQCD parton spectrum at RHIC is so steeply falling that distinguishing even a moderate shift in parton energy from complete parton absorption is essentially impossible. In essence, energy loss models are effectively only probed in the vicinity of zero energy loss and as a result, only the pathlength dependence of energy loss offers some discriminating power at RHIC kinematics. At LHC, this is no longer the case: Due to the much flatter shape of the parton spectra originating from 2.76 AGeV collisions, the available data probe much deeper into the model dynamics. A simultaneous fit of the nuclear suppression both at RHIC and LHC kinematics has thus a huge potential to discriminate between various models with equally good description of RHIC data alone.

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