SCET Workshop 2022



Contribution ID: 22

Type: not specified

An EFT derivation of the saturation scale (remote)

Wednesday, 20 April 2022 12:00 (20 minutes)

I will talk about an EFT formulation for understanding the physics of saturation in Deep Inelastic scattering using the Glauber EFT for forward scattering. I ll show how to derive a factorization formula that manifestly decouples the physics of the probe, the Quark-antiQuark Dipole, from the universal physics of the medium, namely a hadron or a large nucleus, by treating the probe as an Open quantum system.

Using this framework, I will, for the first time give the definition of the Saturation scale for small x DIS in terms of a matrix element of a gauge invariant operator in the proton state. The saturation scale can be directly related to an emergent length scale in the EFT- the mean free path for the probe, which yields two emergent expansion parameters. These parameters becoming O(1) can be respectively interpreted as the onset of saturation and the breakdown of independent scattering in the medium. I ll also briefly speculate about how the nonlinear regime of the JIMWLK/BK equations can be recovered in this EFT framework.

Primary author: VAIDYA, Varun Presenter: VAIDYA, Varun Session Classification: NGL and Glauber