

Lattice artifacts of Gradient Flow quantities

Thursday 13 February 2025 14:30 (30 minutes)

The Yang Mills Gradient Flow is frequently used in lattice QCD and lattice pure gauge theory with particular focus on precision scale-setting. Other uses include, e.g., (non-perturbative) operator renormalisation and so called smearing.

Aiming at precision physics, all systematics must be kept under good control. I will focus here on the lattice artifacts relevant when attempting continuum extrapolations of Gradient Flowed quantities. Using the framework of Symanzik Effective Field Theory (SymEFT) we can learn about the asymptotically leading lattice-spacing dependence $a^n [2b_0 \bar{g}^2(1/a)]^{\hat{\Gamma}_i}$ for a chosen lattice setup, where $\bar{g}(1/a)$ is the running coupling and the $\hat{\Gamma}_i$ are accessible in SymEFT. These results may guide future ansätze for continuum extrapolations and allow to check for severe problems from $\hat{\Gamma}_i \ll 0$. Results for lattice pure gauge theory are discussed and some outlook on full QCD is given.

Author: HUSUNG, Nikolai

Presenter: HUSUNG, Nikolai

Session Classification: Session 7