

Perturbative Gradient Flow Discussion

Òscar Lara Crosas

University of Zürich and Paul Scherrer Institute

February 12th, 2025

Perturbative Short Flow-Time Expansion

$$\mathcal{O}_i(t) = C_{i,j}(t) \mathcal{O}^{MS}$$

$$C_{i,j} \sim \underbrace{\log}_{\text{RGEs}} + \underbrace{\text{finite}}_{\text{connection to lattice}}$$

RGEs

- LEFT SFTEs (ÒLC, Stoffer, WIP)
- Scalar QCD at 2-loops (talk by Robert H.)
- SMEFT SFTEs (talk by Janosch)

Connection to lattice

- Neutron electric dipole moment SFTEs (talk by Andrea, after this discussion)
- Neutral meson mixing or meson lifetimes (talks by Matthew and Jonas)
- Quark mass determination (talks by Hiromasa and Robert M.)

Some topics for discussion

- Gradient Flow for LEFT and SMEFT renormalization: Gradient Flow vs the rest
- nEDM: SFTEs at 2 loops, and uncertainties in lattice matrix elements
- Background Field Method to avoid gauge variant operators. Or on-shell vs off-shell?
- γ_5 scheme choices
- Lattice physicists: are there any SFTEs that you think would be important to do?