



Contribution ID: 172

Type: Poster

Towards the gradient flow beta function of SU(2) with $N_f = 1$ and 2 adjoint Dirac fermions

Tuesday, 30 July 2024 17:15 (1 hour)

The family of SU(2) theories with matter transforming in the adjoint representation has attracted interest from many angles. The 2-flavour theory, known as Minimal Walking Technicolor, has a body of evidence pointing to it being in the conformal window with anomalous dimension $\gamma_* \approx 0.3$. Perturbative calculations would suggest that the 1-flavour theory should be confining and chirally broken; however, lattice studies of the theory have been inconclusive. In this poster we present a first look at efforts towards the computation of the beta function of these theories using the gradient flow methodology. Following an exploration of the phase diagram of the two theories with Wilson fermions and additional Pauli–Villars fields, we tune the bare fermion mass to near the chiral limit, and subsequently generate ensembles at five lattice volumes and a range of lattice spacings.

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Session Classification: Poster session and reception

Track Classification: Particle Physics Beyond the Standard Model