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The non-perturbative RG β function at the sill of the conformal window

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The RG beta function describes the running of the renormalized coupling and connects the ultraviolet and infrared regimes of quantum field theories. We consider both the finite volume step scaling and the continuous beta function of the gradient flow coupling in SU(3) systems with fundamental fermions. Investigating theories with $N_f = 6$, 8, 10 and 12 flavors allows us to study the onset of the conformal phase. Our simulations are based on Moebious domain wall fermions, but we also consider alternate actions in our quest to reveal the universal phase structure of near-conformal systems.

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