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Approaching the conformal window in SU(2) field theory: a systematic study of the spectrum for Nf=2,4,6, and 8.

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It is expected that SU(2) gauge theory with Nf fundamental fermions has an infrared fixed point when Nf is between ~ 6 and 10. We study the hadron spectrum and scale setting in SU(2) gauge field theory with Nf = 2,4,6,8 using hypercubic stout smeared Wilson-clover (HEX) action. The case Nf = 2 is QCD-like, Nf = 6 is close to the lower edge of the conformal window, and Nf=8 is inside the conformal window. We study the hadron spectrum and decay constants of these theories, and use the gradient flow approach to determine the length scales.

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