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Probing strongly-coupled systems through Dirac eigenmodes ANQI CHENG, ANNA HASENFRATZ, GREGORY PETROPOULOS, DAVID SCHAICH, University of Colorado Boulder — The eigenmodes of the Dirac operator contain a wealth of information about the dynamics of strongly-coupled systems. I will present how to extract the scale-dependent mass anomalous dimension from the renormalization group invariant mode number of the massless Dirac operator. Our method is universal and can be applied to any lattice model of interest. We investigate SU(3) lattice gauge theories with $N_f = 4$, 8 and 12 light or massless fermions. By combining simulations on multiple lattice volumes, and when possible several gauge couplings, we are able to measure the anomalous dimension across a wide range of energy scales. The 4-flavor model behaves as expected for a QCD-like system, while our 12-flavor results indicate the existence of an infrared fixed point. For the 8-flavor model we observe a large anomalous dimension across a wide range of scales.

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