The complete lowest order chiral Lagrangian from a little box

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We are all familiar with the idea of measuring the zero-mass quark condensate from distributions of Dirac eigenmodes in sectors of fixed topology in the epsilon regime. Recent advances in Random Matrix Theory enable one to determine the pseudoscalar decay constant from the response of eigenmodes of quenched fermions to an imaginary isospin chemical potential. I’ve been playing with this idea, from simulations with two flavors of dynamical overlap fermions. Despite relatively coarse lattice spacings, relatively small volumes, low statistics, and not being particularly close to the epsilon regime, I might make it work. Whether I can or not, I’ll have a story.