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Stability of the quantum Lifshitz model in 2+1 Dimensions BENJAMIN HSU, Princeton University, EDUARDO FRADKIN, University of Illinois, Urbana Champaign — Magnetic and electric perturbations to the quantum Lifshitz model in 2+1 dimensions are examined in this paper. The quantum Lifshitz model is an effective field theory for quantum critical systems that include generalized 2D quantum dimer models in bipartite lattices. Magnetic perturbations break the dimer conservation law. Electric excitations have been studied extensively both in the classical 3D model and in the quantum 2D model, but magnetic vortex excitations have been ignored. While they are forbidden in classical 3D statistical mechanics, they are allowed in the quantum version. To study the interplay of both excitations, we perform a perturbative renormalization group study to one loop order. This is done by generalizing the operator product expansion to anisotropic models. The relation with recent classical Monte Carlo simulations will be discussed.

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