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Renormalization group flow of linear sigma model with UA(1) anomaly

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Motivated by recent arguments on effective restoration of UA(1) symmetry around the critical temperature in two-flavor QCD, we investigate the renormalization group flow of the U(2)xU(2) linear sigma model (LSM) with the traditional epsilon expansion. Introducing the UA(1) violation, the attractive basin falling into the O(4) LSM in the parameter space and its dependence on the size of UA(1) violation are determined. Employing a mass-dependent renormalization scheme, we also look into how the theory with 8 degrees of freedom (U(2)xU(2) LSM) reduces the one with 4 (O(4) LSM).

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