

The rooted staggered determinant in the Schwinger model

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Abstract: We investigate the continuum limit of the rooted staggered determinant in the 2-dimensional Schwinger model. We match both the unrooted and rooted staggered determinants with an overlap fermion determinant of two (one) flavors and a local pure gauge effective action by fitting the coefficients of the effective action and the mass of the overlap operator. The residue of this fit measures the difference of the staggered and overlap fermion actions. We show that this residue scales at least as $O(a^2)$, implying that any difference, be it local or non-local, between the staggered and overlap actions becomes irrelevant in the continuum limit. For the model under consideration here, this observation justifies the rooting procedure for the staggered sea quark action.