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Towards leading isospin breaking effects in mesonic masses with open boundaries

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We present an exploratory study of leading isospin breaking effects in mesonic masses using $O(a)$ improved Wilson fermions with open boundaries. Isospin symmetry is explicitly broken by distinct masses and electric charges of the up and down quarks. In order to be able to make use of existing isosymmetric QCD gauge ensembles we apply reweighting techniques. The path integral describing QCD+QED is expanded perturbatively in powers of deviations in the quark masses and the inverse strong coupling as well as the electromagnetic coupling. We have formulated $\mathrm{QED}_{\mathrm{L}}$, which we use as a finite volume formulation of QED, for open boundaries. We will also give a first insight into contributions from quark disconnected diagrams.

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