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Partially connected contributions to baryon masses in QCD+QED

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Full QCD+QED simulations allow to evaluate isospin breaking corrections to hadron masses. With the open-QxD code, we are able to perform these simulations employing C-periodic boundary conditions, implemented through a doubling of the physical lattice along one spatial direction.

The use of these boundary conditions introduces non-zero Wick contractions between two quark or two antiquark fields, that, in the case of the computation of baryon masses, lead to partially connected additional contributions that we expect to vanish in the infinite volume limit. These contributions are challenging because they involve an all-to-all propagator connecting one point in the physical lattice and one in the mirror lattice. We present a way to compute these corrections to the Ω^- baryon mass using a combination of point and stochastic source inversions.

This work is part of the program of the RC* collaboration.

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