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## Non-renormalization theorem and cyclic Leibniz rule in lattice supersymmetry

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We propose a lattice model of a complex SUSY quantum mechanics which realizes the non-renormalization theorem on lattice. In our lattice model, the Leibniz rule in the continuum, which cannot hold on lattice due to a no-go theorem, is replaced by the cyclic Leibniz rule (CLR) for difference operators. It is shown that the CLR allows two of four supercharges of the continuum theory to preserve while a naive lattice model can realize one supercharge at the most. A striking feature of our lattice model is that there are no quantum corrections to potential terms in any order of perturbation theory. This is one of characteristic properties of SUSY theory in the continuum. It turns out that the CLR plays a crucial role in the proof of the non-renormalization theorem. This result suggests that the CLR grasps an essence of supersymmetry on lattice.

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