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Complex Langevin simulations for PT-symmetric models

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Self-interacting scalar quantum field theories possessing PT-symmetry are physically admissible since their energy spectrum is real and bounded below. However, models with PT-invariant potentials can have complex actions in general. Thus, they cannot be studied using methods based on traditional Monte Carlo due to a sign problem. We use complex Langevin dynamics to study two-dimensional supersymmetric models exhibiting PT invariance. In the literature, using perturbative calculations, SUSY is intact in these models even though parity is broken. In order to answer the question on non-perturbative SUSY breaking, we perform simulations of these models using the complex Langevin method.

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