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A local update algorithm for supersymmetric Yang-Mills quantum mechanics

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We present a local update algorithm for gauge theories with dynamical fermions which allows simulations in fixed canonical sectors. As a first application we perform canonical simulations in N=4 supersymmetric Yang-Mills quantum mechanics without a sign problem. Compared to previous studies, we obtain results with significantly better accuracy. We also discuss some aspects of the physics of this theory, including the appearance of flat directions in the bosonic potential and of phase transitions related to those.

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