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Phases of the frustrated XY model on the honeycomb lattice JUAN CARRASQUILLA, Perimeter Institute for Theoretical Physics, ANDREA DI CIOLO, Joint Quantum Institute and Department of Physics, University of Maryland, FEDERICO BECCA, SISSA-International School for Advanced Studies, VICTOR GALITSKI, Joint Quantum Institute and Department of Physics, University of Maryland, MARCOS RIGOL, Department of Physics, The Pennsylvania State University — We study the phase diagram of the frustrated XY model on the honeycomb lattice by using accurate correlated wave functions and variational Monte Carlo simulations. Our results suggest that a spin-liquid state is energetically favorable in the region of intermediate frustration, intervening between two magnetically ordered phases. We briefly discuss our results in the light of recent DMRG simulations where instead of a spin liquid, an unsual magnetically ordered state is found.

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