Abstract Submitted
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Extremal Optimization for p-Spin Models[1] STEFAN FALKNER, STEFAN BOETTCHER, Emory University — It was shown recently that finding ground states in the 3-spin model on a 2d dimensional triangular lattice poses an NP-hard problem [1]. We use the extremal optimization (EO) heuristic [2] to explore ground state energies and finite-size scaling corrections [3]. EO predicts the thermodynamic ground state energy with high accuracy, based on the observation that finite size corrections appear to decay purely with system size. Just as found in 3-spin models on r-regular graphs, there are no noticeable anomalous corrections to these energies. Interestingly, the results are sufficiently accurate to detect alternating patters in the energies when the lattice size L is divisible by 6. Although ground states seem very prolific and might seem easy to obtain with simple greedy algorithms, our tests show significant improvement in the data with EO.

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[2] PRL 86 (2001) 5211,
[3] S. Boettcher and S. Falkner (in preparation).

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