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DMRG Study of Anisotropic Triangular Heisenberg Lattice ANDREAS WEICHSELBAUM, Ludwig Maximilians University, Munich, Germany, STEVEN R. WHITE, UC Irvine, USA — The anisotropic antiferromagnetic two-dimensional triangular Heisenberg lattice for spin 1/2 describes certain classes of transition-metal oxides (TMOs) and chalcogenides (TMCs) supported by experimental data. The understanding of the ground state properties of this frustrated system from a theoretical point of view, however, has remained an extraordinary challenge. In the model under consideration, quasi-one-dimensional Heisenberg chains of uniform intrachain coupling strength J interact with their neighboring chains via the triangular interchain coupling J'. By varying the anisotropy ratio $j = J'/J$ from $j = 0$ (decoupled Heisenberg chains) to $j = 1$ (uniform triangular lattice with finite Neel order like local magnetization), it was pointed out [1,2] that spin liquid properties up to remarkably high values of j of about 0.85 exist. We present in detail our results on the incommensurable correlations using DMRG with special care given to finite size effects. We argue that incommensurable correlations persist throughout the entire range of $j \in [0, 1]$.
[1] S. Yunoki et al., PRB 74, 014408 (2006).
[2] D. Heidarian et al., PRB 80, 012404 (2009).

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