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Nature of the Spin-Liquid Ground State of the S=1/2 Heisenberg Model on the Kagome Lattice STEFAN DEPENBROCK, LMU Munich, IAN MCCULLOCH, The University of Queensland, ULRICH SCHOLLWOECK, LMU Munich — We perform a density-matrix renormalization group (DMRG) study of the $S = \frac{1}{2}$ Heisenberg antiferromagnet on the kagome lattice to identify the conjectured spin liquid ground state. Exploiting SU(2) spin symmetry, which allows us to keep more than 16,000 DMRG states, we consider cylinders with circumferences up to 17 lattice spacings and find a spin liquid ground state with an estimated per site energy of $-0.4386(5)$, a spin gap of 0.13(1), very short-range decay in spin, dimer and chiral correlation functions and finite topological entanglement γ consistent with $\gamma = \log_2 2$, ruling out gapless, chiral or non-topological spin liquids. At the same time, DMRG results provide strong evidence for a gapped topological Z_2 spin liquid.

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