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Numerical Evidences of Fractionalization in an Easy-Axis Two-Spin Heisenberg Antiferromagnet[1] DONNA SHENG, Cal. State Univ. Northridge, LEON BALENTS, University of California, Santa Barbara — Based on exact numerical calculations, we show that the generalized Kagome spin model in the easy axis limit exhibits a spin liquid, topologically degenerate ground state over a broad range of phase space, including a point at which the model is equivalent to a Heisenberg model with purely two-spin exchange interactions. We present an (to our knowledge the first) explicit calculation of the gap (and dispersion) of "vison" excitations, and exponentially decaying spin and vison 2-point correlators. These are hallmarks of deconfined, fractionalized and gapped spinons. The nature of the phase transition from the spin-liquid state to a magnetic ordered state tuned by a negative four-spin "potential" term is also discussed in light of the low energy spectrum. These results greatly expand the range and the theoretical view of the spin-liquid phase in the vicinity of the RK exactly soluble point. Numerical indications of the spin-liquid phase in other spin models will also be discussed.

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