Abstract Submitted
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Thermodynamics of deconfined bosonic spinons in two dimensions[1] VALERI KOTOV, University of Vermont, ANDERS SANDVIK, OLEG SUSHKOV, Boston University — We consider the quantum phase transition between a Neel antiferromagnet and a valence-bond solid (VBS) in a two-dimensional system of $S = 1/2$ spins. Assuming that the excitations of the critical ground state are linearly dispersing deconfined spinons obeying Bose statistics, we derive expressions for the specific heat and the magnetic susceptibility at low temperature T. Comparing with quantum Monte Carlo results for the J-Q model, which is a candidate for a deconfined Neel–VBS transition, we find excellent agreement, including a logarithmic correction in the susceptibility. In our treatment, this is a direct consequence of a confinement length scale $\Lambda \propto \xi^{1+a} \propto 1/T^{1+a}$, where ξ is the correlation length and $a > 0$ (with $a \approx 0.2$ in the model).
Reference: A. W. Sandvik, V. N. Kotov, and O. P. Sushkov, arXiv:1010.2522 (2010).

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Valeri Kotov
University of Vermont

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