Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Deconfined spinons and metamagnetism in the J-Q model[1] ADAM IAIZZI, ANDERS W SANDVIK, Boston Univ — We study the J-Q model on a square lattice of localized $S = 1/2$ degrees of freedom. This model augments the standard $S = 1/2$ Heisenberg antiferromagnet exchange, J, with a four-spin interaction, Q, that induces a quantum phase transition from the Néel antiferromagnet to a valence-bond solid state. At the phase boundary, the elementary excitations are presumably deconfined spinons ($S = 1/2$ bosons). Going beyond previous studies [1], we use a magnetic field to produce a macroscopic ground-state density of spinons and find that they produce a linear contribution to the low-temperature specific heat as predicted using a low-energy effective spinon theory [2]. As in the previously studied 1D case [3], at high field there is a metamagnetic transition to saturation driven by the onset of attractive interactions between magnons beyond a minimum value of Q/J. [1] H. Shao, W. Guo, and A. W. Sandvik, Science **352**, 213 (2016) [2] H. D. Scammell and O. P. Sushkov, Phys. Rev. Lett. **114**, 055702 (2015). [3] A. Iaizzi, K. Damle, and A. W. Sandvik, arXiv:1603.04359.

[1]The work of AI and AWS was supported by the NSF under grants No. DMR-1104708 and DMR-1410126.

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Date submitted: 10 Nov 2016 Electronic form version 1.4