Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Odd q-State Clock Spin-Glass Models in Three Dimensions, Asymmetric Phase Diagrams, and Multiple Algebraically Ordered Phases EFE ILKER, Sabanci University and Case Western Reserve University, A. NIHAT BERKER, Sabanci University and MIT — Distinctive orderings and phase diagram structures are found, from renormalization-group theory, for odd q-state clock spin-glass models in $d = 3$ dimensions [1]. These models exhibit asymmetric phase diagrams, as is also the case for quantum Heisenberg spin-glass models. No finite-temperature spin-glass phase occurs. For all odd $q \geq 5$, algebraically ordered antiferromagnetic phases [2,3] occur. One such phase is dominant and occurs for all $q \geq 5$. Other such phases occupy small low-temperature portions of the phase diagrams and occur for $5 \leq q \leq 15$. All algebraically ordered phases have the same structure, determined by an attractive finite-temperature sink fixed point where a dominant and a subdominant pair states have the only non-zero Boltzmann weights. The phase transition critical exponents quickly saturate to the high q value as previously observed for even q-state clock models [4].

[1] E. Ilker and A. N. Berker, Phys. Rev. E **90**, 062112 (2014)

[2] A. N. Berker and L. P. Kadanoff, J. Phys. A **13**, L259 (1980)

[3] A. N. Berker and L. P. Kadanoff, J. Phys. A **13**, 3786 (1980)

[4] E. Ilker and A. N. Berker, Phys. Rev. E **87**, 032124 (2013)

Efe Ilker
Sabanci University and Case Western Reserve University

Date submitted: 05 Nov 2015 Electronic form version 1.4