

Abstract Submitted  
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**Deconfined criticality in "easy-plane"  $SU(N)$  anti-ferromagnets<sup>1</sup>**

JONATHAN D'EMIDIO, GANPATHY MURTHY, RIBHU KAUL, University of Kentucky — Motivated by evidence for deconfined criticality in  $SU(N)$  anti-ferromagnets, we investigate the phase diagram of these models in the case where the  $SU(N)$  symmetry is reduced to rotations about the diagonal generators ("easy-plane" symmetry). We carry out extensive numerical simulations using quantum Monte Carlo, revealing a first-order magnetic to valence bond solid phase transition that becomes a continuous deconfined transition at large  $N$ . We support our numerical data by performing epsilon expansions of the easy-plane deformed  $CP^{N-1}$  field theory near both the upper and lower critical dimensions. This renormalization group analysis shows that the symmetric deconfined fixed point is unstable in the presence of easy-plane anisotropy, resulting in a runaway flow for intermediate values of  $N$  and a flow towards a stable easy-plane deconfined fixed point at large  $N$ , which is consistent with the critical behavior of our lattice models.

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