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Experimental Consequences of O(3) Deconfined Criticality in 2+1 D Antiferromagnets DAVID I. SANTIAGO, Instituut-Lorentz, Leiden University, ZAIRA NAZARIO, Max Planck Institute for the Physics of Complex Systems, Dresden — The paramagnetic phase of 2+1 D antiferromagnets can be described in terms of electrodynamics of charged, massive bosonic spinons interacting through an emergent compact U(1) gauge field. Spinons in the paramagnet are confined due to the presence of nontrivial tunneling effects, instantons which provide a long range interaction between the gauge fields and the charges that gaps the gauge fields and provides a linear potential for the charges. The instantons responsible for spinon confinement in the paramagnetic phase vanish at the quantum critical point. Therefore, spinons are deconfined at criticality. We have recently obtained the effective theory that describes the universal physics of these deconfined critical points. From the deconfined critical theory, we calculate the critical Neel field propagator and find a critical exponent eta=1. We also obtain measurable effects and quantities that follow from the prediction eta=1 and serve as characterization of O(3) deconfined criticality. Those are the inelastic and elastic neutron scattering response, Nuclear Magnetic Resonance (NMR) response, magnetic field response and the specific heat. All of these response functions serve to define the O(3) deconfined universality class.

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