Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Loop statistics in the Coulomb phase LUDOVIC JAUBERT, OIST, Okinawa, Japan, MASUD HAQUE, RODERICH MOESSNER, MPI-PkS, Dresden, Germany — The Coulomb phase is a classical gauge field theory arising in frustrated systems with "divergence free" constraints, such as spin ice [1]. In this talk, we show how this phase can be understood as a loop model, and characterized by their loop length distribution and fractal dimensions [2]. Comparing similar models in 2- and 3-dimensions allows us to extract insights from connections to Stochastic-Loewner Evolution (SLE) processes, percolation and polymer physics. We mention implications of these results for related models and experiments (Heisenberg magnets, itinerant electrons [3]).

[1] Henley, Annual Review of Condensed Matter Physics **1**, 179 (2010).
[2] Jaubert, Haque, Moessner, Phys. Rev. Lett. **107**, 177202 (2011)
[3] Jaubert, Pitaecki, Haque & Moessner, in preparation (2012).

Ludovic Jaubert
OIST, Okinawa, Japan

Date submitted: 07 Dec 2011 Electronic form version 1.4