Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Possible deconfined critical transition in bilayer graphene JUNHYUN LEE, SUBIR SACHDEV, Department of Physics, Harvard University — Deconfined criticality describes a quantum transition between two ordered states with unrelated symmetry, which is not allowed in the Landau-Ginzburg-Wilson framework [1]. Although many numerical studies have shown evidence for deconfined criticality, it has not yet been observed in experiments. We point out that the conductivity measurements in suspended bilayer graphene [2] could imply the presence of such a transition. The phase transition is between two insulating phases and occurs in a finite magnetic field when we tune the electric field, both fields perpendicular to the graphene plane. We argue that in the strong coupling limit, the effective spin Hamiltonian of bilayer graphene suggests a "Néel to a kekulé valence bond solid" transition. We also present the study of zero-energy states in the VBS vortex near the critical point.

[1] T. Senthil et al, Science 303, 1490 (2004).
[2] R. T. Weitz et al, Science 330, 812 (2010).

Junhyun Lee
Department of Physics, Harvard University

Date submitted: 15 Nov 2013 Electronic form version 1.4