Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

**Resistance noise in electrically biased bilayer graphene** ATINDRA NATH PAL, ARINDAM GHOSH, Department of Physics, Indian Institute of Science, Bangalore 560 012, India. — The growing interest in bilayer graphene (BLG) is fueled by the ability to control the energy gap between its valence and conduction bands through external means. Here, we demonstrate experimentally that the low-frequency resistance fluctuations, or noise, in bilayer graphene is strongly connected to its band structure, and displays a minimum when the gap between the conduction and valence band is zero. Using double-gated bilayer graphene devices we have tuned the zero gap and charge neutrality points independently, which offers a unique mechanism to investigate the low-energy band structure, charge localization and screening properties of bilayer graphene. We show: (1) the noise to be minimum when band gap ($\Delta_g$) = 0 even if it corresponds to a nonzero carrier density (n), (2) the evidence of localized states near the band tails even at $\Delta_g = 0$, with a mobility edge that strongly depends on the external electric field E, and finally, (3) a method to directly determine the dielectric properties of BLG in both electron and hole-doped regimes.

Atindra Nath Pal
Department of Physics, Indian Institute of Science, Bangalore 560 012, India.

Date submitted: 21 Nov 2008 Electronic form version 1.4