

---

# Charge transport and low frequency noise in bilayer graphene

Sheng-Shiuan Yeh<sup>\*1</sup>, Yen-Jung Lee , Wei-Hao Chou , and Juhn-Jong Lin<sup>†</sup>

<sup>1</sup>Institute of Physics, National Chiao Tung University (IOP, NCTU) – 1001 University Road, Hsinchu, Taiwan

## Abstract

We have measured charge transport and low frequency noise in several bilayer graphene devices. We found that the conductivity as a function of temperature can be described by the two-dimensional Mott variable-range hopping (VRH) at various back gate voltages. This implies the existence of localized states within the electric-field-induced band gap. On the other hand, in contrast to monolayer graphene, we found that the noise magnitude reveals a minimum value around the charge neutrality point (CNP), and increases as the gate voltage is swept away from CNP. The noise behavior can be understood in terms of the transport properties. The consistency between transport and noise characteristics provides a unified understanding of the underlying mechanism. This may be helpful to develop low-noise nanoelectronics based on bilayer graphene.

---

<sup>\*</sup>Speaker

<sup>†</sup>Corresponding author: [jjlin@nctu.edu.tw](mailto:jjlin@nctu.edu.tw)