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Band gap estimation in bilayer graphene through quantum capacitance measurement KOSUKE NAGASHIO, TOMONORI NISHIMURA, AKIRA TORIUMI, University of Tokyo — The estimation of the quantum capacitance (C_Q) through the capacitance measurement provides the direct information on Density of states (DOS) in graphene since the energy cost to induce carriers is introduced as $C_Q = e^2 DOS$ in series with the geometrical capacitance (C_{ox}) in the equivalent circuit ($1/C \quad = 1/C_{ox} \quad + 1/C_Q$). For bilayer graphene with Y_2O_3 topgate structure, the band gap opening was qualitatively observed in DOS - energy relation estimated from C_Q under the large displacement. The band gap determined by C_Q was larger than the transport gap determined by variable-range hopping in gap states on IV measurement since carriers which respond to the alternating voltage are not required to transport throughout the device.

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