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**Electroluminescence from individual air-suspended carbon nanotubes within split-gate structures**[1] N. HIGASHIDE, T. UDA, M. YOSHIDA, A. ISHII, Y. K. KATO, The University of Tokyo — Electrically induced light emission from chirality-identified single-walled carbon nanotubes are investigated by utilizing split-gate field-effect devices fabricated on silicon-on-insulator substrates. We begin by etching trenches through the top silicon layer into the buried oxide, and the silicon layer is thermally oxidized for use as local gates [1]. We partially remove the oxide and form gate electrodes, then contacts for nanotubes are deposited on both sides of the trench. Catalyst particles are placed on the contacts, and nanotubes are grown over the trench by chemical vapor deposition. We use photoluminescence microscopy to locate the nanotubes and perform excitation spectroscopy to identify their chirality. Gate-induced photoluminescence quenching is used to confirm carrier doping [2], and electroluminescence intensity is investigated as a function of the split-gate and bias voltages.

[1] M. Jiang, Y. Kumamoto, A. Ishii, M. Yoshida, T. Shimada, Y. K. Kato, Nature Commun. 6, 6335 (2015).
[2] S. Yasukochi, T. Murai, S. Moritsubo, T. Shimada, S. Chiashi, S. Maruyama, Y. K. Kato, Phys. Rev. B 84, 121409(R) (2011).

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