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Focused electron beam from open-tip single-wall carbon nanotubes SANGBONG LEE, SEUNGCHUL KIM, JISOON IHM, School of Physics, Seoul National University, Seoul, Korea — Open-tip single-wall carbon nanotubes can produce focused electron spot in the field emission. We calculate direct evolution of the nanotube wavefunction under applied electric field by solving the time dependent Shrödinger equation in the first principles scheme. (5,5), (10,10), and (12,12) carbon nanotubes are investigated and We obtain the focused spot size of a few angstroms. The spot size of electron beam from the (10,10) tube is smaller than that of the (5,5) or (12,12) tube. We also find that s-like state near the Fermi level contributes most to the field emission current.

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