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Coherent Graphene Devices: Movable Mirror, Buffer and Memory[1] L. ZHAO, Department of Physics, University of Connecticut, Storrs, CT 06269, S. F. YELIN, Department of Physics, University of Connecticut, Storrs, CT 06269; ITAMP, Harvard-Smithsonian Center for Astrophysics, Cambridge, MA 02138 — We theoretically report that, at a sharp electrostatic step potential in graphene, massless Dirac fermions can obtain a Goos-Hänchen-like shift under total internal reflection. Based on these results, we study the coherent propagation of the quasiparticles along a sharp graphene *p-n-p* waveguide and derive novel dispersion relations for the guided modes. Consequently, coherent graphene devices (e.g. movable mirror, buffer and memory) induced only by the electric field effect can be proposed.

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L. Zhao
Department of Physics, University of Connecticut, Storrs, Connecticut 06269

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