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In-plane electrical transport across cavity-quantum well system in Bose-Einstein condensate phase MING XIE, ALLAN MACDONALD, University of Texas at Austin — Cavity polaritons are coupled states of quantum well excitons and vertical cavity photons which can undergo Bose-Einstein condensation under appropriate circumstances. The macroscopic condensate state can be described by two coupled order parameters - the coherent exciton field and the coherent photon field. When the dominant process for electron transfer between conduction and valence bands is by scattering off the photon condensate, electrical bias voltages can be used to control the condensate. We study the in-plane transport properties of electrical current through the cavity-quantum well system, and show how the coherent photon fields respond to the current flow. The possibility of tailoring light via electrical current and vice versa simultaneously might lead to interesting new applications.

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