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Imaging fringes in magnetic focusing of electron waves MELAKU MULUNEH, ROBERT WESTERVELT, ROB PARROTT, ERIC HELLER, Harvard University, MICAH HANSON, ART GOSSARD, UC Santa Barbara — Magnetic focusing of the electron flow between two quantum point contacts (QPCs) in a two-dimensional electron gas (2DEG) in a GaAs/AlGaAs heterostructure occurs when the QPC spacing is an integer multiple of the diameter of a cyclotron orbit. Images of magnetic focusing taken with a cooled scanning probe microscope (SPM) exhibit fringes when multiple paths of electrons interfere, as well as branching of the electron paths caused by small angle scattering [1]. We use simulations to show that one could improve images of fringe structures by using devices smaller than the length required to form branches. The distance between QPCs can be made quite small (~ 0.5 microns) without destroying the fringe structure. We plan to test our simulations using double QPC devices.

[1] Kathy Aidala *et al.* to be published (2007).

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