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Experimental Study of Low Density Quantum Hall Fabry-Perot Interferometer SIMAS GLINSKIS, SANGHUN AN, WOOWON KANG, Univ of Chicago, LEONIDAS OCOLA, Argonne National Lab, LOREN PFEIFFER, KEN WEST, KIRK BALDWIN, Princeton — In this talk we report on study of interference oscillations observed in Fabry-Perot $1.5\mu m$ diameter interferometers fabricated from low density, high mobility AlGaAs/GaAs heterostructures. The Fabry-Perot interferometers were fabricated using e-beam lithography and inductively coupled plasma etching to minimize sample damage. Optimization of the quantum point contacts were made by systematically varying the etching depth and monitoring the resistance of the device. So far we have been able to detect clear interference oscillations which are observed at integer quantum Hall states. The interference oscillations occur in the low magnetic field side of the Hall plateaus when there is substantial backscattering at the quantum point contacts. A linear relationship between filled Landau levels and oscillation frequencies establishes that our interferometers are in the Coulomb dominated regime described by the interacting model of quantum Hall Fabry-Perot interferometers. Study of interference oscillations in the fractional quantum Hall states are currently under progress and will be discussed.

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