Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

**Flux Period Scaling in the Laughlin Quasiparticle Interferometer** WEI ZHOU, F.E. CAMINO, V.J. GOLDMAN, Stony Brook University — Aharonov-Bohm superperiod was rececently reported for electron interferometer devices in the quantum Hall regime, where electron paths circle a 2D electron island. The electron island main confinement is produced by etch trenches, into which front gate metal is deposited. We determine experimentally the A-B period $\Delta_B$ at several front gate voltages $V$ for electrons ($f = 1$) and Laughlin quasiparticles (2/5 embedded in 1/3). For moderate $|V| \leq 300$ mV, on each QH plateau, we find linear dependence of $\Delta_B$ on $V$. For $f = 1$, the electron A-B path area $S$ can be found from $\Delta_B$ using flux quantization condition $\Delta_\Phi = S\Delta_B = h/e$ for the flux period $\Delta_\Phi$. The A-B area enclosed by the $f = 1/3$ edge channel (the 2/5 island area) is not known independently if the FQH flux period is not known a priory. The front gate voltage dependence of $\Delta_B$ provides such independent determination of the 2/5 island area. The directly measured values of $\Delta_B$ and its slope $d\Delta_B/dV$ can be combined to derive the voltage $V(1e)$ attracting a unit charge to the area of the A-B path, assuming $S$ is known. For a many-electron ($\sim$2000) 2D disc of radius $r$, the product $rV(1e)$ should be approximately constant, independent of the QH filling or the area. Thus the $f = 2/5$ island area can be determined directly with a $\sim$10% accuracy, which is quite sufficient to distinguish the physically reasonable possibilities of the flux periods $5h/e$, $5h/2e$, $1h/e$, and $h/2e$.

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Date submitted: 29 Nov 2005 Electronic form version 1.4