

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Alternating $e/4$ and $e/2$ period interference oscillations as evidence for filling factor $5/2$ non-Abelian quasiparticles ROBERT WILLETT, Bell Laboratories, Alcatel-Lucent, LOREN PFEIFFER, KENNETH WEST, Princeton University — It is a theoretical conjecture that $5/2$ fractional quantum Hall state charge $e/4$ excitations may obey exotic non-Abelian statistics. In edge state interference these purported non-Abelian quasiparticles should display period $e/4$ Aharonov-Bohm oscillations if the interfering quasiparticle encircles an even number of localized $e/4$ charges, but suppression of oscillations if an odd number is encircled. To test this hypothesis, here we perform swept area interference measurements at $5/2$. We observe an alternating pattern of $e/4$ and $e/2$ period oscillations in resistance. This aperiodic alternation is consistent with proposed non-Abelian properties: the $e/4$ oscillations occur for encircling an even number of localized quasiparticles, $e/2$ oscillations are expressed when encircling an odd number. Aperiodic alternation corresponds to the expected area sweep sampling the localized quasiparticles. Importantly, adding localized quasiparticles to the encircled area by changing magnetic field induces interchange of the $e/4$ and $e/2$ oscillation periods, specifically consistent with non-Abelian $e/4$ quasiparticles.

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Date submitted: 20 Nov 2009

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