

MAR13-2012-000393

Abstract for an Invited Paper
for the MAR13 Meeting of
the American Physical Society

Quantum Hall Interferometry and Detection of Anyonic Braiding Statistics

STEVEN SIMON, Oxford University

In two spatial dimensions quantum mechanical particles are not limited to being bosons or fermions as they are in three dimensions, but can be particles known as anyons. Such anyons come in two major varieties — Abelian and non-Abelian — both of which were long ago predicted to be realized in certain Fractional Quantum Hall (FQH) systems. However, experimental demonstration of anyonic braiding properties has remained elusive and very controversial. New results by Willett et. al. and Kang et. al. have been interpreted as evidence of anyonic braiding in Fabry Perot interferometers in the second Landau level. In this talk, I will discuss my current understanding of these works based on a number of recent publications.

References:

- [1] arXiv:1112.3400, Braiding of Abelian and Non-Abelian Anyons in the Fractional Quantum Hall Effect, Sanghun An, P. Jiang, H. Choi, W. Kang, S. H. Simon, L. N. Pfeiffer, K. W. West, K. W. Baldwin
- [2] Physical Review B 85, 201302, 2012, Telegraph noise and the Fabry-Perot quantum Hall interferometer, Bernd Rosenow, Steven H. Simon