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Abstract for an Invited Paper
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Quantum Hall interferometry in abelian and non-abelian states

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This talk deals with the theory of quantum Hall interferometers. I will first consider an idealized model of such interferometers and review how they may potentially identify anyonic quasi-particles, both abelian and non-abelian. I will then describe lessons learned from experiments regarding this idealized model, and how it should be amended to take into account effects of coupling between the bulk and the edge. In particular, I will describe how electron-electron interaction affects the outcome of interferometry experiments and distinguishes between "Aharonov-Bohm" and "Coulomb-dominated" regimes. These two regimes are characterized by different magnetic field periodicities and different directions of the equi-phase lines in the plane of magnetic field and voltage applied to a side gate. I will discuss how the contributions of the Aharonov-Bohm effect, the Coulomb interaction and the fractional statistics (abelian and non-abelian) may be distinguished from one another in the two regimes. Finally, I will address issues unique to non-abelian states, particularly the effect of bulk-edge tunnel coupling on the interference, and comment on experimental observations of interference in the $\nu = 5/2$ state.

[1]The works I will describe have been carried out with B.I. Halperin (Harvard), I. Neder (Harvard & Tel-Aviv), Bernd Rosenow (Leipzig) and S.H. Simon (Oxford)