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Electric Fields in the 5/2 fractional quantum Hall effect[1] ANTHONY TYLAN-TYLER, Univ of Pittsburgh, YULI LYANDA-GELLER, Purdue University — The potential for non-Abelian quasiholes in the 5/2 fractional quantum Hall effect makes the state of interest theoretically and experimentally. The presence of such features in the ground state of the system would allow for the implementation of a topological quantum computation scheme. In order to probe the system for these features, a small measuring voltage, i.e. an electric field, is applied. In Corbino geometries, these electric fields are applied radially. This breaks the Galilean invariance, which in an infinite planar geometry allows us to transform to a moving frame of reference, eliminating the electric field. To study the effects of these fields, we carry out exact diagonalization calculations in a disk geometry. We find that application of small fields can lead to an improvement in the overlap with the Moore-Read Pfaffian long before the state is destroyed by the field. Additionally, we find that the coherence length of quasiholes travelling along the edge of the sample increases significantly when compared to the case with no applied field.

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