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FQHE interferometer in strong tunneling regime: The role of compactness of edge fields SRIRAM GANESHAN, University of Maryland, College Park, ALEXANDER ABANOV, DMITRI AVERIN, Stony Brook University — The defining feature of quantum Hall states is the existence of topologically protected massless edge states. These states are believed to be effectively described by a theory of chiral bosons also known as the one-dimensional chiral Luttinger Liquid. The tunneling experiments provide one of the natural ways to probe these edge states. In this work, we consider multiple-point tunneling in the interferometers formed between edges of electron liquids with in general different filling factors in the regime of the Fractional Quantum Hall effect (FQHE). We derive an effective matrix Caldeira-Leggett model for the multiple tunneling contacts connecting the chiral single-mode FQHE edges. We show that the compactness of the Wen-Fröhlich chiral boson fields describing the FQHE edge modes plays a crucial role in defining strong (quasiparticle) tunneling regime. We also show that the compactness condition results in electron periodicity for quasiparticle tunneling with respect to adiabatic variation of flux.

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