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Tunneling spectroscopy of 5/2 fractional quantum Hall excitations in etch defined quantum point contacts MADHU THALAKULAM, WEI PAN, Sandia National Labs, K.W. BALDWIN, K.W. WEST, L. PFEIFFER, Princeton University — Ever since its discovery the fractional quantum Hall (FQH) state at the even denominator filling fraction v=5/2 has generated immense interests among researchers. 5/2 FQH excitations are believed to obey non-Abelian statistics and posses topological properties making them an ideal candidate for the proposed fault tolerant topological quantum computation. Theoretical proposals to characterize the topological properties of the5/2 state are usually based on confined geometries. In this work we report the characterization of the 5/2 state using quasiparticle tunneling experiments in quantum point contacts (QPC). We have successfully fabricated QPCs on high mobility GaAs/AlGaAs heterostructures using conventional photolithography followed by etching and evaporation of Cr/Au depletion gates. Our samples show very stable FQH plateaus at v = 7/3, 5/2 and 8/3 filling fractions. Tunneling experiments are performed in the QPCs at various temperatures and also at various pinch-off voltages to characterize the effective charge and Coulomb interaction parameters of the quasiparticles. (Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000).

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