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The role of Coulomb interactions in quantum Hall inter-edge tunneling AKAKII MELIKIDZE, National High Magnetic Field Lab, KUN YANG, National High Magnetic Field Lab — We study theoretically the tunneling between quantum Hall edge states across a line junction as a model for the experiment of I. Yang et al, Phys. Rev. Lett. 92, 056802 (2004). We specifically concentrate on the role of Coulomb interactions in the cascade of phase transitions that has been observed experimentally as the magnetic field was varied. We conclude that despite the strong interactions, the zero-temperature phase transitions should be in the same universality class as one would expect for non-interacting edge excitations. This is in disagreement with the behavior inferred in the experiment. We attribute this to the fact that the true low-temperature universality regime had not been attained. The relevant crossover temperature emerges naturally in our model. This work was supported by NSF grant No. DMR-0225698.

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