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Resonant tunneling in fractional Hall effect CHUNTAI SHI, Department of Physics,104 Davey lab,The Pennsyvania State University, JAINENDRA JAIN, Department of Physics,104 Davey lab,The Pennsyvania State University —
We study theoretically the possible transitions of a fractional quantum Hall island surrounded by another fractional quantum Hall state, induced by either the variation of the magnetic field or a backgate voltage, and find a rich set of possibilities in addition to the one considered previously[1],The elementary transitions correspond to the addition or removal of a composite fermion from the edge or the interior of the island; combinations of elementary transitions may occur simultaneously due to electrostatic constraints. Relevance to a recent experiment[2] is considered, which measures the resonant tunneling of composite fermions through their quasi-bound states around such a 2/5 island surrounded by the 1/3 sea. It is shown that the results are consistent with the notion of fractional braiding statistics, but can be explained on the basis of fractional charge alone. We also perform calculations based on microscopic composite fermion wavefunctions of finite systems to test the theoretical considerations. [1]J.K.Jain, S.A.Kivelson, and D.J.Thouless, Phys.Rev.Lett.**71**, 3003(1993). [2]F.E.Camino, W.Zhou, and V.J.Goldman, Phys.Rev.B **72**, 075342(2005).

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