Quasiparticle tunneling in fractional quantum Hall liquids

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Motivated by quasiparticle interference experiments, we discuss the tunneling amplitude for a quasiparticle tunneling along a straight path between the two edges of a fractional quantum Hall annulus. In the Moore-Read state, quasiparticles of charge $e/4$ (non-Abelian) and $e/2$ (Abelian) may co-exist and both contribute to edge transport. The tunneling amplitude for charge $e/2$ quasihole is exponentially smaller than that for charge $e/4$ quasihole, and the ratio between them can be partially attributed to their charge difference. In addition, the tunneling amplitude exhibits scaling behavior originated from the propagation and tunneling of charged quasiparticles in an effective field analysis. The scaling exponent is found to be related to the conformal dimension of the quasiparticles. In the Read-Rezayi Z_k-parafermion states, the non-Abelian quasiparticle tunneling amplitudes exhibit nontrivial k-dependent corrections to the scaling exponent.