Nature of Quasielectrons and the Continuum of Neutral Bulk Excitations in Laughlin Quantum Hall Fluids BO YANG, Institute of High Performance Computing, F.D.M. HALDANE, Princeton University — We construct model wavefunctions for a family of single-quasielectron states supported by the $\nu = 1/3$ fractional quantum Hall (FQH) fluid. The charge $e^* = e/3$ quasielectron state is identified as a composite of a charge-$2e^*$ quasiparticle and a $-e^*$ quasihole, orbiting around their common center of charge with relative angular momentum $n\hbar > 0$, and corresponds precisely to the "composite fermion" construction based on a filled $n = 0$ Landau level plus an extra particle in level $n > 0$. An effective three-body model (one $2e^*$ quasiparticle and two $-e^*$ quasiholes) is introduced to capture the essential physics of the neutral bulk excitations. We also explore different ways of representing many-body wavefunctions in fractional quantum hall fluids, including the holomorphic wavefunctions, Jack polynomial formalisms and the diagrammatic representations. (Bo Yang and F.D.M. Haldane, PRL 112, 206804).

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