Study of Quasiholes in FQHE for different Landau Levels\textsuperscript{1} R.N. BHATT, SONIKA JOHRI, Department of Electrical Engineering, Princeton University, ZLATKO PAPIC, Perimeter Institute for Theoretical Physics, PETER SCHMITTECKERT, Karlsruhe Institute of Technology — We study the sizes of elementary quasiholes in $\nu = 1/3$ and $\nu = 7/3$ quantum Hall states. Calculations are carried out by exact diagonalization and density matrix renormalization group method for spherical and cylindrical geometries. We use both short- and long-range pinning potentials to localize the quasihole [Johri et. al arXiv:1310.2263]. The size of the quasihole in the model Laughlin state is estimated to be around $\approx 2.5\ell_B$, where $\ell_B$ is the magnetic length. In contrast, the size of the quasihole in the Coulomb ground state at filling factor $\nu = 1/3$ is $\approx 4\ell_B$, while that at $\nu = 7/3$ is $\approx 7\ell_B$. Our results support the earlier findings by Balram et. al [PRL 110, 186801 (2013)] that the $e/3$ quasihole in the first excited Landau level is significantly larger than in the lowest Landau level.

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