

Abstract Submitted  
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**Carbon nanotubes as tunable Luttinger liquids** WADE DEGOTTARDI, University of Illinois Urbana-Champaign, TZU-CHIEH WEI, Institute for Quantum Computing, SMITHA VISHVESHWARA, University of Illinois at Urbana-Champaign — We investigate the properties of single-walled carbon nanotubes in transverse electric and magnetic fields. We find via band structure calculations that these fields can break particle-hole symmetry as well as that of the two Dirac points. Additionally, the speed of the left and right movers is generally different in the presence of both electric and magnetic fields. We consider the effect of these fields on Coulomb interactions within the tube and show that they can be used to tune the interaction parameter  $K$  associated with the Luttinger liquid properties of the tube. Finally, we discuss finite size effects and Coulomb blockade physics in this context.

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