

Abstract Submitted
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Proximity superconductivity in graphene Landau levels GAURAV CHAUDHARY, Univ of Texas, Austin, XIAO LI, Univ of Maryland, College Park, ALLAN MACDONALD, Univ of Texas, Austin — We study monolayer graphene sheets in the quantum Hall regime that are proximity coupled to an s -wave superconducting thin film. At magnetic fields near H_{c2} triangular vortex lattice states form in the superconductor and induce similar vortex lattice states in the graphene sheets. We use the Bogoliubov-de Gennes theory to study the properties of quasiparticle excitations in the graphene sheets, and find that the quantized Hall conductance survives even in such a vortex lattice state. We further explore the possibility of realizing topological superconductivity in such a system. In addition, we propose that under some circumstances the vortex cores may host zero-energy bound states which are Majorana fermions.

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