Proximity-induced superconductivity in graphene quantum Hall topological insulator

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Quantum Hall Topological Insulator phase (QHTI) is characterized by an insulating bulk and two counter-propagating edge channels having opposite spin polarization i.e. helical edge states. Recently, our team has been able to induce this regime in graphene-based heterostructures deposited on $SrTiO_3$ substrates [1], a high-*k* dielectric constant material. In this work, we further exploit this platform by adding superconducting electrodes made of a-MoGe in which superconductivity can withstand the magnetic field required to induce the QHTI phase in graphene. Using transport measurements, we observed clear signatures of induced superconductivity in the QHTI phase at 1.2 tesla. This study underpins the possible use of graphene heterostructures as a platform for topological superconductivity [2].

References

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