Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Andreev reflection at graphene-superconductor interface in the quantum Hall regime. DA WANG, EVAN TELFORD, AVISHAI BENYAMINI, ANDREW WIETESKA, JAMES HONE, CORY DEAN, ABHAY PASUPATHY, Columbia Univ — At metal-superconductor interface Andreev processes occur where an electron tunneling into the superconductor carries with it a second electron, effectively reflecting a hole with opposite momentum back into the metal. This is due to the superconducting gap, which, at low energies, only allows the formation of cooper pairs inside the superconductor, representing an accessible way to measure many body tunneling phenomena. An important requirement for strong Andreev processes is a clean interface with a high transmission probability. As shown recently, graphene and bi-layer graphene are perfect candidates as they can have extremely clean interfaces to superconductors. Graphene also has a remarkably large mean free path, which allows accurate measurement of reflected and transmitted currents. In the quantum hall regime, chiral edge states open new possibilities to measure novel Andreev processes. So far, experimental evidence and a clear physical picture of Andreev processes at the interface of graphene systems in the quantum Hall regime is a work in progress. In this work, we present recent experimental results on graphene-superconductor interfaces created in a well-controlled inert atmosphere.

Da Wang
Columbia Univ

Date submitted: 11 Nov 2016 Electronic form version 1.4