

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Thermal Hall effect in the underdoped cuprate superconductor $\text{YBa}_2\text{Cu}_3\text{O}_{6.5}$ ¹ PHUAN ONG, MAX HIRSCHBERGER, TIAN LIANG, Princeton University, TOSHINAO LOEW, Max Planck Institute Stuttgart, WEI LI LEE, Princeton University, R. RITZ, Technische Universitaet Muenchen, BERNHARD KEIMER, Max Planck Institute Stuttgart — The thermal Hall conductivity κ_{xy} (Righi-Leduc effect) is tailor-made to probe the transport properties of Bogolyubov quasiparticles (QPs) in a superconductor because neither the phonons nor vortices contribute to the off-diagonal response. We report measurements of κ_{xy} in untwinned crystals of underdoped $\text{YBa}_2\text{Cu}_3\text{O}_{6.5}$, extending from 100 K to 15 K in fields H up to 14 T. Several key features will be described. At all temperatures T , the QPs are hole-like. However, there is a small negative contribution that appears just below T_c . Below 30 K, the curve of κ_{xy}/T vs. H approaches an apparent universal step-like profile that may reflect the behavior of long-lived Dirac excitations confined to orbits around the gap nodes in an intense magnetic field. Measurements to much lower T and higher H (~ 32 T) are planned.

¹Supported by NSF-MRSEC under Grant DMR 0819860

Phuan Ong
Princeton University

Date submitted: 09 Nov 2012

Electronic form version 1.4