Probing the nodal metal in LBCO with heat transport

RAMZY DAOU, LOUIS TAILLEFER, Universite de Sherbrooke, QIANG LI, GENDA GU, Brookhaven National Laboratory — The cuprate superconductor \( \text{La}_x\text{Ba}_{2-x}\text{CuO}_4 \) (LBCO) has a near-zero minimum in the superconducting transition temperature at \( x = 1/8 \). This is accompanied by the emergence of static one-dimensional spin and charge ordering in “stripes” [1]. Spectroscopic measurements at the same doping in the normal state have shown that a gap with d-wave symmetry is present in the single particle spectrum [2]. One possible origin of this gap is the destruction of the coherence of the superconducting ground state by phase fluctuations, suppressing \( T_c \) while leaving gapped but “uncondensed” Cooper pairs and nodal quasiparticles. We present measurements of the thermal conductivity of LBCO at very low temperature in both superconducting and field-induced nodal metal states. [1] P. Abbamonte et al., *Nature Physics* 1, 155 (2005) [2] T. Valla et al., *Science*. 10.1126/1134742 (2006)