

Abstract Submitted  
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**Observation of Nonlocal Coherence Between Normal Metals Coupled by a Superconductor**<sup>1</sup> PAUL CADDEN-ZIMANSKY, JIAN WEI, VENKAT CHANDRASEKHAR, Northwestern University — In conventional superconductors the effective size of the constituent Cooper pairs can approach several hundred nanometers, a length scale accessible by nanolithographic techniques. By placing two normal metals on a superconductor within a coherence length of each other, it has been predicted that the quasiparticles in the separate metals can be coherently coupled by the Cooper pairs through the nonlocal processes of Elastic Cotunneling and Crossed Andreev Reflection. We present experimental observations of coherent, nonlocal thermoelectric effects between normal metals coupled to a superconductor by using a hybrid normal-superconductor interferometer. The sign of the observed thermoelectric voltage can be switched using an external field, indicating that the voltage is dynamically driven by a persistent current induced in the interferometer.

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