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Nonlocal correlations in a proximity-coupled normal metal TAEWAN NOH, SAM DAVIS, VENKAT CHANDRASEKHAR, Northwestern University — We report evidence of large, nonlocal correlations between two spatially separated normal metals in superconductor/normal-metal (SN) heterostructures, which manifest themselves a nonlocal voltage generated in response to a driving current. Unlike prior experiments in SN heterostructures, the nonlocal correlations are mediated not by a superconductor, but by a proximity-coupled normal metal. The nonlocal correlations extend over relatively long length scales in comparison to the superconduncting case. At very low temperatures, we find a reduction in the nonlocal voltage for small applied currents that cannot be explained by the quasiclassical theory of superconductivity. We believe is a signature of new long-range quantum correlations in the system.

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