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Shot noise measurements in diffusive wire NSN structures¹ MARTIN STEHNO, D.J. VAN HARLINGEN, University of Illinois at Urbana-Champaign — Subgap transport across a normal metal/superconductor interface requires a conversion from normal to supercurrent. We study the conversion process in superconducting wire samples by attaching two short diffusive normal metal wires at a distance comparable to the coherence length in the superconductor. In addition to ordinary Andreev reflection, nonlocal processes involving electronic states in both contacts (Crossed Andreev reflection, and Elastic Co-tunneling) are expected to contribute and to give rise to a cross-conductance signal in transport measurements. As one of the wire contacts is biased into the shot noise regime, a significant increase of current fluctuations is observed in the other (unbiased) contact. Only a small fraction of the noise measured in the two contacts is correlated. The magnitude of the correlated signal scales with the observed cross-conductance. We will compare our results with theoretical predictions for nonlocal transport and previous experimental work.

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