

Abstract Submitted
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Divergent beams of nonlocally entangled electrons emitted from NS structures¹ FERNANDO SOLS, Universidad Complutense de Madrid, ELSA PRADA, Universität Karlsruhe — We propose the use of normal and Andreev resonances in normal-superconducting structures to generate divergent beams of nonlocally entangled electrons. Resonant levels are tuned to selectively transmit electrons with specific values of the perpendicular energy, thus fixing the magnitude of the exit angle. When the normal metal is a ballistic two-dimensional electron gas, the proposed scheme guarantees arbitrarily large spatial separation of the entangled electron beams emitted from a finite interface. We perform a quantitative study of the linear and nonlinear transport properties of some suitable structures, taking into account the large mismatch in effective masses and Fermi wavelengths. Numerical estimates confirm the feasibility of the proposed beam separation method.

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