

Abstract Submitted
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Josephson junctions formed from superconducting nanowires¹ B. XIAO, H.Y. CHEN, I. NSANZINEZA, C. SONG, B.L.T. PLOURDE, Syracuse University — We are investigating the possibility of forming Josephson junctions from thin-film superconducting nanowires. The Josephson coupling through such a constriction can provide the necessary nonlinearity, for example, for forming a qubit, while avoiding the influence of defects in the amorphous tunnel barriers used in conventional Josephson junctions that can contribute to qubit decoherence. We have developed a fabrication process based on high-resolution electron-beam lithography with a negative-tone resist combined with ion-beam etching to pattern nanowires from 10 nm-thick, sputter-deposited, amorphous MoGe thin films. We have studied nanowires with widths between 20 - 100 nm and lengths between 50 - 200 nm. A Nb wiring layer provides electrical connections to the nanowires. Low-temperature transport measurements allow us to study the nanowire critical current and the influence of microwave irradiation on the current-voltage characteristics.

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