

Abstract Submitted
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Enhanced superconductivity at the interface of W/Sr₂RuO₄ point contact¹ JIAN WEI, HE WANG, WEIJIAN LOU, JIAWEI LUO, Peking Univ, YING LIU, Pennsylvania State University, J.E. ORTMANN, Z.Q. MAO, Tulane University — Differential resistance measurements are conducted for point contacts (PCs) between the Sr₂RuO₄ (SRO) single crystal and the tungsten tip. Since the tungsten tip is hard enough to penetrate through the surface layer, consistent superconducting features are observed. Firstly, with the tip pushed towards the crystal, the zero bias conductance peak (ZBCP) due to Andreev reflection at the normal-superconducting interface increases from 3% to more than 20%, much larger than previously reported, and extends to temperature higher than the bulk transition temperature. Reproducible ZBCP within 0.2 mV may also help determine the gap value of SRO, on which no consensus has been reached. Secondly, the logarithmic background can be fitted with the Altshuler-Aronov theory of electron-electron interaction for tunneling into quasi two dimensional electron system. Feasibility of such fitting confirms that spectroscopic information like density of states is probed, and electronic temperature retrieved from such fitting can be important to analyse the PC spectra. Third, at bias much higher than 0.2 mV there are conductance dips due to the critical current effect and these dips persist up to 6.2 K. For more details see Phys. Rev. B 91, 184514 (2015).

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