

Abstract Submitted
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Tunneling magnetoresistance studies of $\text{Sr}_3\text{Ru}_2\text{O}_7$ JOE HOOPER, MENG ZHOU, ZHIQIANG MAO, Tulane University, USA, ROBIN PERRY¹, YOSHITERU MAENO, Kyoto University, Japan — Recent work has supported the existence a new type of field- tuned quantum phase transition (QPT) in the double layered ruthenate $\text{Sr}_3\text{Ru}_2\text{O}_7$. To further probe the physical properties near this QPT, we have performed planar tunneling measurements on $\text{Sr}_3\text{Ru}_2\text{O}_7$ single crystals. Our previously reported work revealed an unusual oscillation in tunneling magnetoresistance. We here report further characterization of this new phenomenon, showing that the oscillation has a systematic dependence on the tunnel barrier, temperature, and the field orientation. The oscillation pattern is identical even for different barrier materials (such as Al_2O_3 and SiO), but is only prominent when the junction resistance is between roughly 15Ω and $1\text{k}\Omega$. The oscillation shows a field orientation dependence for $H//c$ and $H//ab$, both in its pattern and its temperature dependence. The oscillation frequency for $H//ab$ appears to be smaller than that for $H//c$. We discuss possible origins of this unusual oscillation phenomenon in light of recent bulk measurements on $\text{Sr}_3\text{Ru}_2\text{O}_7$.

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