

Abstract Submitted  
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**Superconducting pairing symmetries in the 3-K and bulk phases of  $\text{Sr}_2\text{RuO}_4$**  ZHENYI LONG, BENJAMIN CLOUSER, RONALD MEYER, SONGRUI ZHAO, KELLY MCCARTHY, YING LIU, Pennsylvania State University, HIROSHI YAGUCHI, YOSHITERU MAENO, Kyoto University, Japan, TIJIANG LIU, ZHIQIANG MAO, Tulane University — We report recent progress on our single-particle tunneling and phase-sensitive measurements on 3-K and bulk phases of  $\text{Sr}_2\text{RuO}_4$ . The latter refers to an eutectic phase of  $\text{Sr}_2\text{RuO}_4$  that features Ru microdomains embedded in a single crystal of  $\text{Sr}_2\text{RuO}_4$ . These Ru microdomains are of a mesoscopic size and varying shape. Therefore their pairing symmetries are not subject to the same set of constraints as those in the bulk. We have performed tunneling measurements on the 3-K phase to identify *all* possible pairing states in this unique superconducting system. The junctions used earlier were prepared by pressing In wire onto a cleaved *ab* face of a Ru-containing  $\text{Sr}_2\text{RuO}_4$  single crystal containing multiple Ru microdomains. More recently we focused on tunnel junctions prepared on pre-selected single Ru microdomains. Possible existence of an intrinsic mixed pairing state in the interior of a Ru microdomain featuring simultaneous presence of both the *s*- and *p*-wave superconducting condensates. We will also discuss briefly our current effort in the phase-sensitive measurements on bulk  $\text{Sr}_2\text{RuO}_4$ , focusing on detecting possible  $/k_z$  dependence of the order parameter and the existence of domains.

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