

Abstract Submitted
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Two-Gap Superconductivity in $\text{Lu}_2\text{Fe}_3\text{Si}_5$ TSUYOSHI TAMEGAI, YASUYUKI NAKAJIMA, GUOJI LI, Department of Applied Physics, The University of Tokyo — $\text{Lu}_2\text{Fe}_3\text{Si}_5$ is a superconductor with $T_c \sim 6$ K containing nonmagnetic irons. Anomalous temperature dependence of specific heat in the superconducting state has been reported in polycrystalline samples; reduced specific heat jump at T_c and apparent residual T -linear term in the limit of $T=0$ K. We have successfully grown high-quality single crystals of $\text{Lu}_2\text{Fe}_3\text{Si}_5$ using the floating-zone technique, and characterized its superconducting and normal state properties. The anomalies of the specific heat reported in polycrystalline samples are reproduced in the single crystals. In addition, we find a second drop of the specific heat below 1 K. We can fit the temperature dependence of the specific heat by assuming two superconducting gaps as in the case of MgB_2 . Temperature dependence of Hall coefficient is nonmonotonic, and also suggests the presence of multiple bands in this compound.

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