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Second-order Structural Transition in Superconductor $La_3Co_4Sn_{13}$ YIU WING CHEUNG, JINGZHAO ZHANG, JUNYI ZHU, WING CHI YU, YAJIAN HU, DIGE WANG, Department of Physics, The Chinese University of Hong Kong, China, YUKA OTOMO, KAZUAKI IWASA, Department of Physics, Tohoku University, Japan, KOJI KANEKO, Materials Sciences Research Center, Japan Atomic Energy Agency, Japan, MASAKI IMAI, HIBIKI KANAGAWA, Department of Chemistry, Kyoto University, Japan, KAZUYOSHI YOSHIMURA, Research Center for Low Temperature and Materials Sciences, Kyoto University, Japan, SWEE KUAN GOH, Department of Physics, The Chinese University of Hong Kong, China — The family of the superconducting quasiskutterudite with general chemical formula $R_3T_4Sn_{13}$ (R = Ca, Sr; T = Rh, Ir) was recently found to feature a structural transition at $T*$. The structural transition can be tuned to a structural quantum critical point by chemical and/or physical pressure, around which a dome-shaped variation of the superconducting transition temperature T_c is found. Similar behavior was found in the isostructural compound $La_3Co_4Sn_{13}$, although there is currently a dispute in the literature regarding the nature of $T*$ transition. To shed light on the interplay of structural instability and superconductivity, we performed resistivity, specific heat and X-ray diffraction measurements on $La_3Co_4Sn_{13}$, focusing particularly on their temperature dependence around $T*$. Our results, in combination with lattice dynamics calculations, are more consistent with the second-order nature of the phase transition at $T*$.

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