

Abstract Submitted
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Gap structure of the iron-based superconductor KFe_2As_2 via thermal conductivity A. JUNEAU-FECTEAU, R.T. GORDON, J.-PH. REID, N. DOIRON-LEYRAUD, L. TAILLEFER, University of Sherbrooke, Canada, M.A. TANATAR, R. PROZOROV, Ames Laboratory and Iowa State University, USA, T. SAITO, H. FUKAZAWA, Y. KOHORI, Chiba University and JST-TRIP, Japan, K. KIHOU, C.H. LEE, A. IYO, H. EISAKI, AIST and JST-TRIP, Japan — The thermal conductivity of the iron-based superconductor KFe_2As_2 was measured at temperatures down to 50 mK in magnetic fields up to 15 T, as a way to probe the superconducting gap structure. A large residual linear term in the $T = 0$ limit is observed in zero field, showing that the gap structure contains nodes, consistent with a previous report [J.K. Dong et al., PRL 104, 087005 (2010)]. We discuss the possible interpretations for the nature of these nodes, in light of three different theoretical proposals: accidental line nodes in an extended s -wave state which are either horizontal [K. Suzuki et al., arXiv:1108.0657] or vertical [S. Maiti et al., arXiv:1111.0306], or symmetry-imposed vertical line nodes in a d -wave state [R. Thomale et al., PRL 107, 117001 (2011)].

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