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Magnetic Field Dependence of Heat Capacity in Single Crystal $BaKFe_2As_2$ Superconductor

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Abstract. The observed heat capacity by external magnetic field for $BaKFe_2As_2$ single crystal is examined through the modified Phenomenological Ginzburg Landau (GL) theory of anisotropic type-II superconductor. In view of this, it has been observed the anisotropy existing with the existence of energy gaps in this particular system and the gaps lying along two perpendicular directions i.e. parallel to *ab*-plane and *c*-axis. Taking the expression of change in specific heat from GL-theory in modified form, we have explained successfully the existence of two bands in type-II superconductors. In doing so a quantitative analysis has been made by calculating and comparing the value of anisotropic ratio in terms of penetration depths.

Keywords: Iron pnictide superconductor, Thermodynamic properties, phase diagram

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[Full Paper]