Estado Sólido Avanzado
Tarea 06: Superconductividad

Dr. Omar De la Peña Seaman

14 mayo 2024

Nombre del Estudiante: _____

Problema 1 *Specific heat variations*

Find the temperature T where,

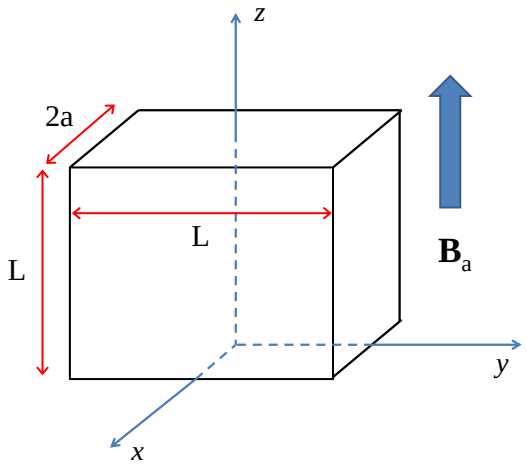
$$C_s(T) = C_n(T),$$

being $C_i(T)$ the specific heat in the $i = s, n$ state (s=superconducting, n=normal).

. . . . . .

Problema 2 *London equations: superconducting flat slab*

For a flat superconducting (SC) slab of finite thickness $2a$ in an applied parallel magnetic field $\mathbf{B}_a = B_a\hat{\mathbf{k}}$,



(a) Demostrate that the field inside the SC slab is given by,

$$B(x) = \frac{\text{Cosh}(x/\lambda_L)}{\text{Cosh}(a/\lambda_L)} B_a.$$

(b) Find that,

$$\mu_0 M(x) = -\left(\frac{1}{8\lambda_L^2}\right)\left[(2a)^2 - 4x^2\right] B_a \quad \forall \quad a \ll \lambda_L,$$

where $M(x)$ is the magnetization of the system.

(c) Finally, calculate the value of the critical field B_c when $a \ll \lambda_L$ and $a \gg \lambda_L$.

. . . . . .