

# A new formula for the energy of bulk superconductivity

Ayman Kachmar

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*Abstract.* The energy of a type II superconductor submitted to an external magnetic field of intensity close to the second critical field is given by the celebrated Abrikosov energy. If the external magnetic field is comparable to and below the second critical field, the energy is given by a reference function obtained as a special (thermodynamic) limit of a non-linear energy. In this note, we give a new formula for this reference energy. In particular, we obtain it as a special limit of a *linear* energy defined over configurations normalized in the  $L^4$ -norm.