

Upper critical fields in inhomogeneous layered superconductors

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Recent experimental studies reported a divergent behavior of the superconducting critical fields along the most conducting a and b axes of Bechgaard salts [1,2]. This feature has been considered as a signature of an FFLO state [2] or a spin triplet phase [3].

Moreover, a general consensus has been achieved, based on different measurements, regarding the inhomogeneous character of low dimensional organic superconductors where superconducting domains coexist with non-superconducting ones.

Such texture raises the question concerning the interplay between the magnetic field and the inhomogeneous structure of the superconducting phase.

Based on the time dependent Ginzburg Landau theory, we derive the upper critical fields in Bechgaard salts assuming the phase segregation state. We find divergent critical fields along the a and the b axes regardless of the nature of the superconducting phase.

[1] J. Shinagawa *et al.*, Phys. Rev. Lett. 98 (2007) 147002.

[2] S. Yonezawa *et al.*, J. Phys. Soc. Jpn. 77 (1008) 054712, S. Yonezawa *et al.*, Phys. Rev. Lett. 100 (2008) 117002.

[3] N. Belmechri *et al.*, Eur. Phys. Lett. 82 (2008) 47009.