

Abstract Submitted  
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**Smearing of the Lifshitz transition by superconductivity<sup>1</sup>** ALEXEI KOSHELEV, KONSTANTIN MATVEEV, Materials Science Division, Argonne National Laboratory — We consider a multiband metal with deep primary bands and a shallow secondary one [1]. In the normal state the system undergoes Lifshitz transition when the bottom of the shallow band crosses the Fermi level. In the superconducting state Cooper pairing in the shallow band is induced by the deep ones. As a result, the density of electrons in the shallow band remains finite even when the bottom of the band is above the Fermi level. We study the density of states in the system and find qualitatively different behaviors on the two sides of the Lifshitz transition. On one side of the transition the density of states diverges at the energy equal to the induced gap, whereas on the other side it vanishes. We argue that this physical picture describes the recently measured gap structure in shallow bands of iron pnictides and selenides.

[1] A. E. Koshelev and K. A. Matveev Phys. Rev. B **90**, 140505(R) (2014)

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