

**INFLUENCE OF TEMPERATURE ON THE IMPURITY-INDUCED  $s_{\pm} \rightarrow s_{++}$  TRANSITION IN THE MULTIBAND MODEL OF Fe-BASED SUPERCONDUCTORS**

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We study the dependence of the superconducting gaps on both the disorder and the temperature within the two-band model for iron-based materials. In the clean limit, the system is in the  $s_{\pm}$  state with the sign-changing gaps [1]. Scattering by nonmagnetic impurities leads to the change of sign of the smaller gap thus resulting in a transition from the  $s_{\pm}$  to the  $s_{++}$  state with the sign-preserving gaps [1,2]. We show here that the transition is temperature-dependent, thus, there is a line of  $s_{\pm} \rightarrow s_{++}$  transition in the temperature-disorder phase diagram [3]. There exists a narrow range of impurity scattering rates, where the disorder-induced  $s_{\pm} \rightarrow s_{++}$  transition occurs at low temperatures, but then the low-temperature  $s_{++}$  state transforms back to the  $s_{\pm}$  state at higher temperatures. With increasing impurity scattering rate, temperature of such  $s_{\pm} \rightarrow s_{++}$  transition shifts to the critical temperature  $T_c$  and only the  $s_{++}$  state is left for higher amount of disorder.

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