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Multilayered ferromagnet/superconductor nanostructures: proximity effect, decoupled superconductivity, and hierarchy of critical temperatures. Y. N. PROSHIN, Kazan State University, Russia, N. G. FAZLEEV, University of Texas at Arlington, USA, M. G. KHUSAINOV, Vostok branch, Kazan State Technical University, Russia — The four-layered F'/S'/F"/S" nanostructure consisting of rather dirty superconducting (S) and ferromagnetic (F) metals is studied within the theory of the proximity effect taking detailed account of the boundary conditions. The new pi phase superconducting states are obtained for the F'/S'/F"/S" nanostructure in addition to the known "superlattice" states. The dependence of the critical temperatures versus the F layers thicknesses is investigated. It is shown that the F'/S'/F"/S" nanostructure can experience decoupled superconductivity. The latter manifests itself through a hierarchy of the critical temperature Tc, which can be different for different S' and S" layers. An optimal set of parameters is determined, for which the difference between the critical temperatures for different S' and S" layers becomes significant. The corresponding phase diagrams are constructed and discussed.

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