

Decoupled superconductivity and hierarchy of transition temperatures in the tetralayer ferromagnet/superconductor nanostructure and control devices

Proshin Y., Khusainov M.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

We predict the decoupled superconductivity for the four-layered $F'/S'/F''/S''$ nanostructure consisting of dirty superconducting (S) and ferromagnetic (F) metals. The predicted hierarchy of critical temperatures is found to manifest itself in its most striking way through arising of different critical temperatures in different superconducting layers S' and S'' . In common case the phase diagram including four different regions is found. Conceptual sketch of the new control nanodevice based on this tetralayer system are proposed. It is shown that they can have up to seven various states. © 2006 American Institute of Physics.

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Keywords

Control device, Critical temperature, Ferromagnetism, Multilayers, Proximity effect, Superconductivity