

Journal of Superconductivity and Novel Magnetism 2012 vol.25 N8, pages 2573-2576

Resonant tunnel magnetoresistance in a double magnetic tunnel junction

Useinov A., Useinov N., Tagirov L., Kosel J.

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

Abstract

We present quasi-classical approach to calculate a spin-dependent current and tunnel magnetoresistance (TMR) in double magnetic tunnel junctions (DMTJ) FML/I/FMW/I/FMR, where the magnetization of the middle ferromagnetic metal layer FMW can be aligned parallel or antiparallel with respect to the fixed magnetizations of the left FML and right FMR ferromagnetic electrodes. The transmission coefficients for components of the spin-dependent current, and TMR are calculated as a function of the applied voltage. As a result, we found a high resonant TMR. Thus, DMTJ can serve as highly effective magnetic nanosensor for biological applications, or as magnetic memory cells by switching the magnetization of the inner ferromagnetic layer FMW. © Springer Science+Business Media, LLC 2011.

<http://dx.doi.org/10.1007/s10948-011-1221-6>

Keywords

Magnetic tunnel junction, Spin-dependent current, TMR, Tunnel magnetoresistance