IrMn-based spin valve structures with low shunt current

B. KOCAMAN[1] and N. AKDOGAN[1,2]

[1] *Department of Physics, Gebze Technical University, 41400 Kocaeli, Turkey*
[2] *Institute of Nanotechnology, Gebze Technical University, 41400 Kocaeli, Turkey*

We systematically studied the exchange bias field (H_{EB}) and the blocking temperature (T_B) in IrMn/Co/Cu/Py/Pt spin-valve multilayers. The blocking temperature of the spin-valve multilayers was significantly enhanced from 160 K to above 395 K by increasing annealing temperature of IrMn layer. This is attributed to the formation of (111) and (002) textures within the antiferromagnetic IrMn, which emerging progressively with increasing annealing temperature. We also investigated IrMn thickness dependence of H_{EB} and T_B. We realized exchange bias above room temperature by using 4 nm IrMn layer. Such thin IrMn layer is also important to reduce the shunt current which lowers the signal to noise ratio of the system. We have also shown that the thicker IrMn layer causes decreasing of the training effect.