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Tailoring Giant Magneto-impedance Effect in Ultrasoft Ferromagnetic Microwires[1] A. CHATURVEDI, A. RUIZ, P. MUKHERJEE, H. SRIKANTH, M.H. PHAN, Department of Physics, University of South Florida Tampa FL 33620, V.S. LARIN, Microfir Thenologii Industriale, Moldavia — Research on soft ferromagnetic microwires exhibiting giant magneto-impedance (GMI) effect, which is a large change of the ac impedance of a ferromagnetic conductor in a static magnetic field, for advanced magnetic sensor applications is an area of topical interest. In this study we show how the GMI effect and its field sensitivity are optimized in Co-B-Si-Mn microwires by varying the magnetic core to glass shell diameter ratio (d). The microwires have been fabricated by the glass-coated melt spinning method. The largest values of GMI (245%) and its field sensitivity 25%/Oe are achieved at $f = 13$MHz for the microwires with d= 0.86. The d dependence of the magneto-impedance has been analyzed based on those of the magneto-resistance and magneto-reactance. Our studies indicate that the microwires with optimized GMI response are attractive candidate materials for structural health self-monitoring and magnetic biosensing applications.

[1]CIFM and FCASST

A. Chaturvedi
Department of Physics, University of South Florida Tampa FL 33620

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