

Magnetic domain structures in amorphous microwires with distributed magnetic anisotropy

A. Chizhik,¹ A. Zhukov,^{1,2,3} and P. Gawronski⁴

¹*Department of Advanced Polymers and Materials: Physics,
Chemistry and Technology, Faculty of Chemistry,
University of Basque Country, San Sebastian, Spain*

²*Ikerbasque, Basque Foundation for Science, 48011 Bilbao, Spain*

³*Departamento de Física Aplicada, EIG,
University of Basque Country, San Sebastian, Spain*

⁴*AGH Univ. of Science and Technology,
Faculty of Physics and Applied Computer Science, Krakow, Poland*

We studied the magnetic properties of glass covered amorphous microwire that was stress-annealed at temperatures distributed along the microwire length. The Sixtus-Tonks, Kerr effect microscopy and magnetic impedance techniques have been applied. There was a transformation of the magnetic structure across the zones subjected to annealing at different temperatures. The annealing temperature distribution induces the graded magnetic anisotropy in the studied sample. The variety of the surface domain structures depending on the longitudinal location has been discovered. The spiral, circular, curved, elliptic and longitudinal domain structures coexist and replace each other in the process of magnetization reversal. The analysis of the obtained results was carried out based on the calculations of the magnetic structure, assuming the distribution of internal stresses.