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Investigation of the domain structure transformation under mechanical deformations in permalloy microparticles

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Abstract

Using magnetic force microscopy (MFM) and computer simulation it was shown that the mechanical compression of the permalloy microparticles leads to the increase in the effective anisotropy field and the noticeable decrease in the external magnetic field value necessary for the formation of the uniform magnetization in the compressed particle. The analysis of MFM images of microparticles covering the whole substrate surface made it possible to conclude about the uniform or nonuniform distribution of stresses induced in the particles in the different area of the substrate.

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References

[1] Morozov A I 2014 Physics of the Solid State 56 865
[2] Barangi M and Mazamder P 2015 IEEE Nanotechnology Magazine 9 15
[3] Belyaev B A and Izotov A V 2007 Physics of the Solid State 49 1731
[4] Bizyaev D A, Bukharaev A A, Kandrashkin Yu E, Mingalieva L V, Nurgazizov N I and Khanipov T F 2016 Technical Physics Letters 42 1034
[5] Chuklanov A P et al 2016 Journal of Physics C 714 012006
[6] Tiercelin N, Dusch Y, Klimov A, Preobrazhensky V, Giordano S and Pernod P 2011 J. Appl. Phys. 109 07D726
[7] Donahue M J and Porter D G Object oriented micromagnetic framework (OOMMF) (http://math.nist.gov/oommf/) - ref-separator -
[8] Ovchinnikov D V and Bukharaev A A 2001 Technical Physics 46 1014