

Study of magnetic inhomogeneity on the magnetoimpedance effect of soft magnetic alloys

S.M. Mohseni^a and M.M. Tehrani^{a, b}

^aLaser and Plasma Research Institute, Shahid Beheshti University, Evin, 1983963113
Tehran, Iran

^bPhysics Department, Shahid Beheshti University, Evin, 1983963113 Tehran, Iran

In this paper, the rule of magnetic anisotropy and its inhomogeneity due to weakly interactions of magnetic heterogeneous structures with different magnetic properties in locally laser irradiated amorphous ribbons in the low frequency magnetoimpedance (MI) effect has been studied in details. This advances the classical model in which only the first-order anisotropy constant was taken into account and makes possible the study of the influence of the second-order anisotropy constant on the MI effect. This effect is caused by crystallization of magnetic materials at the surface and gradient temperature produced by locally irradiating mechanism of sample's surface in which various active magnetic media can be achieved. Interaction of different magnetic regions is interpreted by taking an average over all parts with various magnetic anisotropies in order to estimate the magnetic permeability and so the MI effect of the whole sample. The model can describe flattened peaks observed in the MI experiments and can describe the changes in the initial magnetization curves.

9.7 cm

13.4 cm

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Corresponding author :

S.M. Mohseni

Address for correspondence :

Laser and Plasma Research Institute, Shahid Beheshti University, Evin, 1983963113
Tehran, Iran

Email address :

m-mohseni@cc.sbu.ac.ir