Dynamics of Domain Wall in Rapidly - Changing Magnetic Field

Simeon Samuhel [a)], Jana Horniaková [b)], Peter Duranka [c)],
Jozef Onufer [d)] and Ján Ziman [e)]

Department of Physics, Faculty of Electrical Engineering and Informatics, Technical University of Košice, Park Komenského 2, 042 00 Košice

[a)] Corresponding author: simeon.samuhel@tuke.sk
[b)] jana.horniakova@tuke.sk, [c)] peter.duranka@tuke.sk, [d)] jozef.onufer@tuke.sk, [e)] jan.ziman@tuke.sk

Abstract. A new experimental method for studying single domain wall (DW) dynamics in bistable microwires is presented. It provides new possibilities to study the dynamics of a domain wall moving in a region of rapidly-changing magnetic field. When the moving DW is forced to change its parameters in a very short time, the corresponding changes in velocity are different for rapid increase and decrease in field strength. Experimental $v(x)$ dependences are compared with theoretical ones which correspond to the case when a DW moves with no inertial effects, or when the DW has enough time to adapt to the field in which it moves. The results obtained support the idea that a DW in bistable microwires is not a solid object, but changes its parameters (e.g. wall velocity) depending on the magnetic field applied.