The Influence of Tensile Stress on Domain Wall Geometry in Bistable Microwire

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In this contribution we present an experiment which provides information about the influence of applied tensile stress on propagating domain wall (DW) in bistable microwire. Measurements were carried out on glass-coated Fe-based microwire with unidirectional effect in domain wall propagation [1].

It has already been shown [2], that DW velocity versus applied magnetic field (*v(H)*) dependences with higher DW mobility (fast DW) are more affected by applied tensile stress than those with lower DW mobility (slow DW). DW shortening with applied magnetic field in bistable microwire has been recently reported [3]. Increasing damping of DW motion resulted in DW shortening of both, slow as well as fast DWs. Shortening of slow DW is more conspicuous than for fast DW and therefore damping is stronger for slow DW.

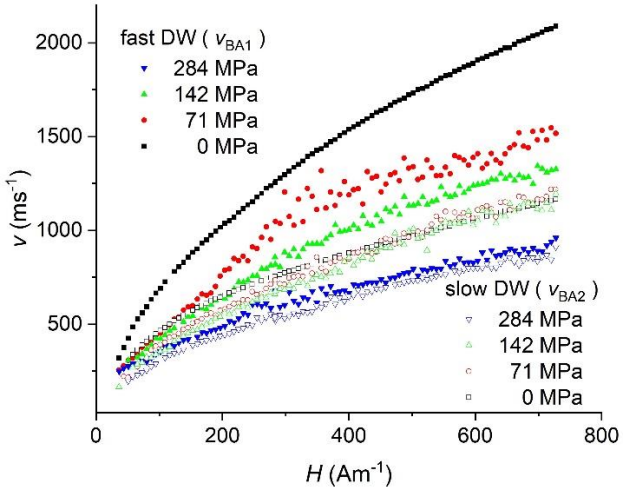

FIGURE 1. DW velocity versus axial field dependences obtained in a sample for various values of tensile stress, for slow DW (open symbols) and fast DW (solid symbols).

The presented experimental results show that *v(H)* dependencies of fast and slow DWs are less steep with increasing applied tensile stress. However, the effect of tensile stress is stronger for fast DWs. With increasing tensile stress, the measured *v(H)* dependencies of fast and slow DWs approach each other until the applied stress of 283 MPa when they overlap and the unidirectional effect is not observed. Further processing of the measured data by the method presented in [3] demonstrates the influence of the tensile stress on DW geometry.

REFERENCES

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