Study of Domain Wall Dynamics in Bistable Magnetic Microwires

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Abstract. The study of domain wall dynamics in bistable magnetic microwires has garnered significant attention due to its potential applications in information storage and sensing technologies. Understanding the behaviour and manipulation of domain walls is crucial for developing efficient and reliable devices. Ferromagnetic glass-coated microwires are among the most promising functional magnetic materials, because of their unique combination of physical (mechanical, magnetic, and anticorrosive) qualities and their fast, low-cost preparation method. This study focuses on investigating the dynamics of domain walls in bistable magnetic microwires through a combination of experimental measurements and theoretical modelling [1]. Measurements were carried out on bistable glass-coated Fe-based microwire in single domain wall propagation. Theoretical models based on experimental results and analytical calculations are developed to elucidate the underlying physical mechanisms governing the dynamics of domain walls in these microwires [1], [2]. These models consider factors such as magnetostatic interactions, exchange interactions, and the influence of external fields or currents. By comparing experimental observations with theoretical predictions, valuable insights into the domain wall dynamics can be obtained. Furthermore, the influence of magnetic properties, such as geometry of domain wall, and anisotropy, on the domain wall motion is explored. Understanding the domain wall dynamics in bistable magnetic microwires will contribute to the design of more efficient and reliable devices with improved performance characteristics.

REFERENCES

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