



## Eddy currents in magnetic nano-structures

By Hrkac, Gino

Condition: New. Publisher/Verlag: VDM Verlag Dr. Müller | Combining Eddy-Current and Micromagnetic Simulations with Finite-Element method | The main motivation to develop a dynamic micromagnetic model that includes eddy currents is the importance of accurate calculations of time dependent micromagnetic processes for magnetic data storage (hard disk recording, magnetic random access memory MRAM) at high data rates and the demand for ultra fast switching in magnetic nanostructures. Computational micromagnetics presents an efficient tool to study these kind of ultra fast spin dynamics. In this work a theory that explains eddy current effects in single and multi domain particles was developed. Based on the theory a model was derived that predicts eddy current contributions in multi-scale particles, which allows to design and predict the behavior of materials that will be used in future magnetic recording heads as well as in magnetic data storage medias. It is shown that the size of the particles, which designates the coherence of the spin structure, is essential for the eddy current net contribution to the effective damping parameter, which is a function of particle size and electric conductivity, and directly influences the magnetization reversal process in sub-micron permalloy structures. | Format: Paperback | Language/Sprache: english...

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