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Landau-Lifshitz Bloch Macrospin Simulations of Magnetization Switching Dynamics in Perpendicular Anistropy CoNi/Pd Magnetic Multilayer Thin Films UFUK KILIC, Bogazici University, Department of Physics, GIOVANNI FINOCCHIO, Dipartimento di Fisica dellaMateria e Ingegneria Elettronica, University of Messina, ISMAIL VOLKAN INLEK, IBRAHIM CINAR, GULEN AKTAS, OZHAN OZATAY, Bogazici University, Department of Physics — Heating magnetic multilayer thin films close to their Curie temperature (Tc) for brief periods of time, in the presence of a magnetic field, will potentially enable ultra-high density magnetic recording while maintaining thermal stability of perpendicular anisotropy magnetic media. This idea is to be exploited in thermally assisted magnetic recording (TAR) technology, which is currently being pursued by many academic and industrial research labs. In our study, we have performed macrospin simulations of the magnetization switching based on the numerical solution of Landau-Lifshitz-Bloch equation at such elevated temperatures (close to Tc) for a strongly exchange coupled and high perpendicular anisotropy CoNi/Pd magnetic multilayer thin film structure (Tc=448 K). We will discuss the results of a comprehensive model for this material system taking into account temperature dependencies of anisotropy, saturation magnetization and transverse and longitudinal susceptibilities and their effects on the switching process.

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