EDGE PINNING EFFECTS AND GIANT THERMAL INSTABILITY IN THIN NANO-SCALE MAGNETS

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9.7 cm

Magnetization reversal modes of super-thin strip and nano-scale particles of high magnetization and low anisotropy are analyzed by solving magnetic moment motion equations. Evolution of branches of major and minor hysteresis loops governed by the edge pinning effects of magnetization is described in the dependence on hard bias field, width and thickness of the particle. The crucial change of minor loops for some bias fields in the disperse array of the super-thin magnets is predicted. The influence of thermal fluctuations is taken into account on the basis of the fluctuation-dissipation theorem for the linearized systems. The giant switching fields instability connected with the mutual random inter-conversion of the main magnetization modes characteristic for the super-thin particles is observed by numerical simulations.

13.4 cm

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