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Exchange coupled graded/soft/graded film with well-isolated grains fabricated by post-annealing FANG WANG, University at buffalo, Shanxi Normal University, JING ZHANG, JUN ZHANG, CHUNLING WANG, XIAOHONG XU, Shanxi Normal University — In order to solve the trilemma issue in perpendicular recording media, exchange spring and exchange coupled composite media have been proposed to reduce the coercivity of the hard magnetic layer without sacrificing the thermal stability. Thereafter, Suess proposed the graded media with a continuous variation in anisotropy to reduce the coercivity even further. Here we present an anisotropy-graded [FePt/C]5/Fe/[C/FePt]5 film, where C layer thickness gradually and symmetrically increases from two FePt ends to the soft Fe layer. In contrast with FePt/Fe bilayer, the graded/soft/graded film has a large reduction of 74% in coercivity. Adding C layers with different thickness not only tailors the Ku gradient, but also refines the grain size and weakens the intergranular exchange interaction. Micromagnetic simulation reveals that the magnetization reversal is initiated by domain wall formation at the center of the soft Fe layer followed by domain wall propagation in two FePt layers simultaneously. This work was supported by the National Science Foundation for Distinguished Young Scholars (Grant No. 51025101), NSFC (Grant No. 60776008, 51101095).

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