Abstract Submitted
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New Perpendicular Media by Engineering Thermal Stability and Writing Capability Separately[1] JIAN-PING WANG, W.K. SHEN, J.M. BAI, N.M. KHAN, ECE Dept., Univ. of Minnesota — We experimentally demonstrated two novel approaches to tune the thermal stability (K_uV/k$_B$T) and coercivity of perpendicular media separately to alleviate writing field limitation of perpendicular magnetic recording time by combining a nano-granular FeSiO soft layer and a [Co/PdSi]$_n$ hard layer. 0-4 nm PdSi spacing layer was used to tune the exchanged-coupling strength. The first approach, namely composite media, is to control the exchange coupling strength to a proper value thus the soft region of a grain will switch first with an external field and apply a torque to help the switch of the hard region [1,2]. The coercivity drop at this zone is mainly due to the dynamic tilted switching mechanism. The maximum benefit obtainable is half of the coercivity value of the perpendicular media. The second approach, which can be named as exchange-spring media, is to use Zeeman energy contribution from soft region of a grain to help the switching of hard region of grain. The maximum benefit depends on the moment ratio of soft and hard regions. The thermal stability factor was found the same for all the cases within measurement tolerance. [1] R. Victora and X. Shen, TMRC 2004 [2] J. P. Wang, et al, Appl. Phys. Lett. 2004, submitted & MMM 2004, HB-04, Jacksonville

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