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**Experimental Study of Perpendicular Exchange Spring Media**

ANDREAS BERGER, NATACHA SUPPER, BYRON LENGFIELD, DAVID MARGULIES, ANDREAS MOSER, ERIC FULLERTON, Hitachi Global Storage Technologies — We have investigated the magnetic reversal and recording properties of perpendicular exchange spring media. These structures, which combine a soft and a hard layer material<sup>1</sup>, have recently been proposed as suitable candidates for advanced perpendicular magnetic recording<sup>2</sup>. Previous studies<sup>3</sup> have also shown that the magnetization reversal can be tuned by means of a suitable coupling layer. In our study, we have investigated structures that consist of two magnetic layers having different  $H_K$ -values and being separated by a coupling layer of adjustable thickness. Similar to the results of our previous work on longitudinal exchange spring media<sup>4</sup>, we find that there is an optimum coupling layer thickness, at which the magnetic reversal field is minimized. We also observe in our magnetometry experiments that the most robust parameter to quantify this improved magnetization reversal is the closure field  $H_S$ . The anticipated writability improvements for exchange spring media with optimal interlayer coupling strength are corroborated by detailed recording studies. [1] E.E. Fullerton et al., Phys. Rev. **B 58**, 12193 (1998); [2] R. Victora et al., IEEE Trans. MAG **41**, 537 (2005); [3] K.C. Schuermann et al., J Appl. Phys. **99**, 08Q904 (2006); [4] N. Supper et al., IEEE Trans. MAG **41**, 3238 (2005)

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