Magnetic Force Microscopy Analysis of Double-layered Perpendicular Magnetic Recording Media recorded by using Ring-type head.

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Table I Magnetic properties of single-layered perpendicular magnetic recording medium and double-layered perpendicular magnetic recording media.

Medium	A	B	C
Upper layer	CoNiReP	CoNiReP	CoNiReP
Thickness / μm	0.2	0.2	0.2
M_s / emu cm^{-3}	350	350	350
$H_c(-)$ / Oe	1200	1200	1200
Underlayer	-----	CoB	CoNiP
Thickness / μm		0.03	0.03
M_s / emu cm^{-3}		1000	800
$H_c(u)$ / Oe		25	640

Table II. Read/Write conditions and Head parameters.

Head	Mn-Zn ferrite
B_s / kG	5
Gap length / μm	0.37
Track width / μm	60
Coil turns	15
Relative velocity $\text{m} \cdot \text{s}^{-1}$	1.0

Medium A

Medium B

Medium C

Fig. 1 Representative reproduced waveforms of the isolated pulse (a), presumed models for the recorded magnetization mode (cross-sectional view of the medium), showing the direction of residual magnetization vectors (b), representative top-view MFM images(c), and its averaged cross-sectional view (obtained from trimmed area) (d) of the media A, B, and C. The recording density is 2kFRPI, the peak to valley distance in the waveform and MFM image is $12.7\mu\text{m}$. The full scale of (d) is $\pm 1.5(\text{deg})$.

Medium A

Medium B

Medium C

Fig.2 Representative top-view MFM image (a), its averaged cross-sectional view (b), and the power spectrum (c) of the media A, B, and C.

(Supplementary data)

Fig.3 Dependence of normalized reproduced voltage on recording density.

References

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