Low Noise Media for Future High Density Recording

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H_c and Cr-(110) spacing of CoCrPtTa media with CrMo underlayer

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Cr content dependencies of medium noise and S/N

- Medium noise is reduced by increasing the Cr content.
- High S/Nm is kept at high recording density region.

(MrSt 0.8 memu/cm²) CoCr₁₂₋₁₉Pt₅Ta₂Nb₂/CrMo₁₀
 (○, △): CoCr₁₅Pt₄Ta₄/Cr

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NARROW SIDE-ERASURE IN CoCrPtTa Media

(a) & (b) MFM images of track-edge O/W profiles, (c) cross-track profiles of MR signal by spectrometer on track-edge O/W patterns.

We observed that the transition pattern of the CoCrPtTa medium was quite clear, and that the sides erase band was narrower.

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Limitation of areal density (longitudinal recording)

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Investigation of 8 Gbit/in² Recording Density

Merged Type GMR Head
 • Inductive NiFe/CoFeB
 Spin-valve Head
 • Read Cw= 0.68 μm

Stiction Free Slider
 Protective Layer 8 nm
 CoCr₁₃Pt₅Ta₂Nb₂ 25 nm
 CrMo₅ 25 nm
 Ni-P/Al, TEX. Ra= 1.5 nm
 Mrt= 0.63 memu/cm²
 Hc= 2200 Oe, S'= 0.74

- 1/7 Code Narrow Band PRML
- 10 MB/s data rate
- Siso/Nt= 26.8 dB (o-p/rms) (BW= 60 MHz)
- Magnetic Spacing= 40 nm

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System Components for High Areal Density Magnetic Recording

Integrated suspension (Pico-CAPS)

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conclusions

- We reduced the medium noise by promoting the Cr segregation.
- We investigated the 8 Gb/in² technolog.
- Thermal fluctuation will not cause the problem until 10Gb/in² at the lowest estimate.
- New technology, Stiction Free Slider, Piggyback actuator for precise technology.