

## **Stray fields emanating from longitudinal hard disk writer poles measured by HF-MFM up to 2 GHz**

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### **Abstract**

Using high-frequency magnetic force microscopy (HF-MFM), we investigate the stray fields emanating from hard disk writer poles (longitudinal field) [1,2]. The HF-MFM technique is a further development of the MFM technique. An amplitude-modulated high-frequency current is sent into the hard disk writer coil, and the resulting stray fields are imaged by HF-MFM, employing carrier frequencies up to 2 GHz, which is close to the operating frequency of the most modern recording heads. This advance has become possible due to ferrite-coated MFM cantilevers [2]. For the present measurements, hard disk writer poles stemming from SEAGATE were employed, which are designed to operate at frequencies up to 600 MHz. We observe that, as a function of frequency, the emanating field is forming two peaks around the gap area, and the maximum field is shifting from the central position in the gap towards one side of the writer pole above 1 GHz. This feature is not found in theoretical treatments of the stray fields emanating from writer poles.

### **References**

- [1] M. Abe and Y. Tanaka, IEEE Trans. Magn. 40 1708 (2004)
- [2] M.R. Koblichka, J.D. Wei, T. Sulzbach, A.D. Johnston and U. Hartmann, IEEE Trans Magn. 43 2205 (2007)

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