



EINLADUNG zum IFP-SEMINAR

Co-optimization of conventional magnetic recording head geometries and intrinsic media material properties

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Host: Thomas Schrefl
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Abstract:

A micromagnetic study of the performance potential of bit-patterned magnetic recording media via joint optimization of the design of the media and of the magnetic write heads is presented. Because the design space is large and complex, we developed a novel computational framework suitable for parallel implementation on compute clusters. Our technique combines advanced global optimization algorithms and finite-element micromagnetic solvers. Targeting data bit densities of 2 Tb/in² and 4 Tb/in², we optimize designs for three different writing schemes: centered, staggered, and shingled. The reversal dynamics of the single phase or exchange-coupled composite bit-patterned media islands is treated micromagnetically. The simulation framework takes into account the dynamics of on-track errors and the thermally induced adjacent-track erasure. With co-optimized write heads, the results show superior performance of shingled bit-patterned magnetic recording in contrast to the centered and staggered writing schemes.