Optimizing Graded Recording Media  
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A key limitation of recording densities arises from the fact that maintaining high thermal stability requires high anisotropies, whereas writeability requires low anisotropies: yielding contradictory requirements. Recently, Victora and Shen proposed that the recording density of perpendicular media is increased in exchange spring media: a structure with a soft and a hard layer. A decrease in coercivity up to a factor of 4 has been predicted. Very recently Suess considered a tri-layer system, reporting further increase. In the present work, we report optimizing media where the anisotropy is a continuous function of the thickness. We performed extensive finite element simulations and optimized the media performance by minimizing the coercivity, while maintaining a high energy barrier against thermal decay and the squareness of the hysteresis loop. Simple analytic estimates suggest that a quadratic thickness dependence is optimal. We explore the role of anisotropy convexity, a hard capping layer, and the exchange interaction. This graded anisotropy media decouples minimizing the coercivity while maximizing the barrier height, promising efficient new ways to optimizing recording media.

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