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AIP Prize for Industrial Applications of Physics Lecture: Controlled exchange in recording media and spintronic devices

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Controlled exchange in recording media and spintronic devices Eric Fullerton University of California, San Diego New functionality and performance advantages have been achieved in magnetic recording media by the formation of complex heterostructures and have helped delay predicted recording limits that arise from thermal instabilities in the media [1]. Example media structures include antiferromagnetically coupled (AFC) media [2] and exchange-spring media structures [3, 4] which emerged in longitudinal and perpendicular recording products and have helped to extend recording densities [1]. In this presentation I will review the implementation of exchange-coupled media, the surprising physics that emerged and its impact on hard-drive products. I will further discuss how similar approaches can be used in emerging recording technologies such as heat assisted magnetic recording [4] and bit patterned media [5, 6] as well as many spintronic devices [7,8].

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