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Spin dynamics and thermal stability in L10 FePt[1] TIANRAN CHEN, WAHIDA TOOMEY, West Chester University — Increasing the data storage density of hard drives remains one of the continuing goals in magnetic recording technology. A critical challenge for increasing data density is the thermal stability of the written information, which drops rapidly as the bit size gets smaller. To maintain good thermal stability in small bits, one should consider materials with high anisotropy energy such as L10 FePt. High anisotropy energy nevertheless implies high coercivity, making it difficult to write information onto the disk. This issue can be overcome by a new technique called heat-assisted magnetic recording, where a laser is used to locally heat the recording medium to reduce its coercivity while retaining relatively good thermal stability. Many of the microscopic magnetic properties of L10 FePt, however, have not been theoretically well understood. In this poster, I will focus on a single L10 FePt grain, typically of a few nanometers. Specifically, I will discuss its critical temperature, size effect and, in particular, spin dynamics in the writing process, a key to the success of heat-assisted magnetic recording.

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Tianran Chen
West Chester University

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