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Initiating magnetization switching in computational Fe nanopillars via local heating SAM THOMPSON, GREG BROWN, Florida State University, MARK NOVOTNY, Mississippi State University, PER RIKVOLD, Florida State University — The use of high-coercivity materials in recording media assists in extending the areal information density by allowing smaller, more closely spaced bits. To achieve densities greater than one terabit per square inch, however, the necessary coercivity of the particles challenges the maximum applied field that can be attained by the write head. One proposed technique to overcome this dilemma is heat-assisted magnetization reversal (HAMR), in which a locally applied heat pulse lowers the coercivity, allowing the applied field to initiate switching. To model this, we employ micromagnetic simulations of iron nanopillars with thermal fluctuations that depend spatially and temporally on a solution of the heat equation corresponding to an initial heat pulse applied to the end of the pillar. For the case of an applied magnetic field parallel to the easy axis, the magnetization-switching behavior is explored as a function of total heat input and applied-field magnitude.

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