

Prevalence and recovery of information stored in bundles of parallel magnetic nanowires

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Magnetic nanowires grown within the pori produced in alumina membranes provide a set of parallel nanomagnets subject to orientation by a strong enough magnetic tip [1]. In this way sectors of the membrane can be forced to present a desired magnetic orientation representing symbols or any kind of information. However, parallel magnetized wires forming the symbol raise the energy of the system which could trigger magnetization reversals and partial loss of information. In this paper we tackle two related problems. On one hand, we calculate the interaction energy [2] within different symbols for the case of segmented nanowires trying to stabilize the system in the presence of external magnetic fields. On the other hand, we develop algorithms to recover the original information after it has been partially lost. Recommendations for a safer design of the system are formulated.

References:

- [1] M. Jaafar, J. Gómez-Herrero, A. Gil et al., *Ultramicroscopy* **109**, 693 (2009)
- [2] E. Cisternas, J. Faúndez, and E. E. Vogel, *J. Magn. Magn. Mater.* **426**, 588 (2017)

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