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Magnetic properties of nanosized systems, discrete and continuum approaches[1] PATRICIO VARGAS, DAVID LAROZE, Universidad Santa Maria — In this work we present results obtained with a scaled Monte Carlo technique in two systems: The first one is the system proposed at the NIST web page and known as the μMAg Standard Problem No 3. There, the system is a perfect cube made of a magnetic material, with uniaxial anisotropy and the problem is to find the critical edge length at which the magnetic vortex structure and the most uniform arrangement of magnetization (the so-called flower state) are of equal energy. The second system is a study of the reversion process in an ideally soft magnetic nanowire of cylindrical shape, (diameter of 60nm and 1μm length) at room temperature. By calculating magnetic energies, using continuum and exact methods, in a simple one dimensional discrete system, we show that the usual scaling technique used in some micromagnetic models breaks down at the nanometer scale.

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