Abstract Submitted
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Frequency degeneracy in spin-torque induced precession[1] SHUXIA WANG, PIETER VISSCHER, University of Alabama — Magnetic precession in nanometer elements, first studied by Stoner and Wohlfarth in 1948, is central to the understanding of fast switching in magnetic information storage devices. Periodic orbits have recently gained more attention because they can be stabilized (and their frequencies measured) by spin torque techniques. We have observed a surprising and so far largely unexplained degeneracy in this system: when (as is often the case) there are two orbits with the same energy, even if their shapes and sizes are very different, their frequencies turn out to be the same. Although this is easy to show in the highest-symmetry (uniaxial) case, we find it is true far more generally – for any quadratic energy function with arbitrary anisotropy tensor and arbitrary external magnetic field. We have calculated the frequencies for a random selection of anisotropy tensors and magnetic fields, will show examples of asymmetrical orbits, whose frequencies are equal within numerical accuracy ($\approx 10^{-6}$).

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Pieter Visscher
University of Alabama

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