

Abstract Submitted
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Dipole-Exchange modes in ferromagnetic nano-wires of arbitrary cross sections¹ RODRIGO ARIAS, Universidad de Chile, DOUGLAS MILLS, UC Irvine — We present a method that allows to calculate the eigen-frequencies of dipole-exchange modes in ferromagnetic nano-wires of arbitrary cross sections. The method is setup for calculating modes of long wavelength along the main direction of the nano-wire, but it could be extended to short wavelengths. The basis of the theoretical approach is the extinction theorem, under a form appropriate for the inclusion of the exchange interaction. Appropriate integral equations in the form of contour integrals around the periphery of the wire are obtained for the magnetostatic potentials and magnetization of the modes. We perform a numerical analysis of the eigen-frequencies of geometries of interest, like rectangular and elliptical cross sections, recovering the appropriate limiting values of the magnetostatic or exchange dominated regimes

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