Abstract Submitted
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Parallel pumping of a ferromagetic nanostripe: confinement quantization and off-resonance driving[1] PATRICK YARBROUGH, KAREN LIVESEY, Univ Colorado - Colorado Springs — The parametric excitation of spin waves in a rectangular, ferromagnetic nanowire in the parallel pump configuration and with applied field along the long axis of the wire is studied theoretically, using a semi-classical and semi-analytic Hamiltonian approach. We find that as a function of static applied field strength, there are jumps in the pump power needed to excite thermal spin waves. At these jumps, there is the possibility to non-resonantly excite spin waves near $k_z = 0$. Spin waves with negative or positive group velocity and with different standing wave structure across the wire width can be excited by tuning the applied field. By using a magnetostatic Green's function that depends on both the nanowire's width and thickness – rather than just its aspect ratio – we also find that the threshold field strength varies considerably for nanowires with the same aspect ratio but of different sizes, in contrast to previous work.

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