Title:	Low cost microwave power detector design for Pound Locking scheme and FMR measurements
Authors:	Samarth, Jai
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Abstract:	Microwave resonators are omnipresent, finding their use in devices like cellular net- works, satellite communications, routers, communication systems, radars and scientific instruments. After the showcase of their strong coupling with superconducting qubits [Wallraff 04], they have found their use in many transformational research areas such as microwave quantum optics, quantum computing, study of electromagnetism in the quan- tum limit and simulation of many-particle physics [Koch 07, Gu 17]. Chances are, if there exists a superconducting circuit, it most likely features a microwave resonator. Fast and accurate measurements are desirable. However, noise can arise from various sources such as thermal fluctuations, other electronic components, unintended coupling or interference, such as with two-level systems (1/f noise) creating fluctuations in the natural frequency of such resonators. Pound Locking [Pound 46] is a technique popularly used in quantum optics and precision frequency metrology [Rubiola 08] capable of decoupling this noise from measurements by actively stabilizing the system with a feedback signal, improving signal-to-noise ratio (SNR) and throughput [Lindström 11, van Soest 23]. This thesis is motivated by working towards implementing this technique and proposes a design for an essential component used to measure microwave signal power. The Pound Locking technique is reviewed, and the literature on it is discussed. Fabrication of The pro- posed design is documented, and future possibilities are explored. Ferromagnetic resonance (FMR) measurement techniques are also reviewed and observations are documented.
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