

Abstract Submitted
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Microwave Cavity for Anapole Moment Measurement in Francium¹ JIEHANG ZHANG, DONG SHENG, LUIS OROZCO, Joint Quantum Institute, University of Maryland at College Park — We present a study of the Polka-Dot microwave plano-spherical mirror for a Fabry-Perot resonator. The microwave resonator is an essential element of the apparatus to measure the anapole moment in francium. A crucial requirement for the cavity is the mode-matching into the fundamental Gaussian TEM₀₀ mode. We investigate new coupling mechanisms of the radiation into the cavity to suppress unwanted higher order modes. We are exploring the method of printing two dimensional array of holes and feeding in through horn antennas. According to a HFSS simulation, this method should improve significantly the mode purity in contrast to conventional antenna. We fabricate the mirrors on standard optical blank using standard film deposition techniques with lithographic method to print the pattern. Preliminary tests show resonances, with potential improvements of the Q factors.

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