

Abstract Submitted
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Atomic-candle techniques beyond the small-signal regime ANDREI TRETIAKOV, LINDSAY LEBLANC, University of Alberta — Applying a phase-modulated AC magnetic signal at a frequency near the hyperfine splitting of an atom forces the steady-state population to oscillate at integer harmonics of the modulation frequency. Resonance behaviour of the first two harmonics near the Rabi frequency, known as α and β Rabi resonances, is widely used for microwave field magnetometry and as a power standard, known as the atomic candle. Unlike in previous work, here we explore the Rabi resonances beyond the small-signal approximation using computer simulation and report experimental observations of higher harmonics in cold ^{87}Rb atoms. This will allow us to relax the small-signal assumption and possibly exploit the higher-order harmonics in order to improve precision of magnetometers and power standards based on the atomic candle technique.

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