

Phase sensitive detection via microwave closed loop interferometry

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Rydberg atoms-based sensors are known for high sensitivity for microwave fields and wide reception range, making them a subject of scientific and engineering interest [1, 2, 3]. In this study, we present the phase-sensitive detection of signals using microwave closed loop interferometry in the hot Rb⁸⁵ vapors. Similar setups for resolving phase measurements have been shown before [4]. We propose the solution using microwave fields closed loop, with optical fields being used only to excite atoms to the Rydberg states. Such solution allows for full control of phase between microwave fields, which allows for measuring the probe transmission as a function of mentioned phase. We compare this experimental results with the theoretical model. We also characterize receiver in terms of detection range and sensitivity.

References

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