

Abstract Submitted
for the DAMOP17 Meeting of
The American Physical Society

Study of magnetic resonance with parametric modulation in a potassium vapor cell¹ RUI ZHANG, Peking University and National University of Defense Technology, ZHIGUO WANG, National University of Defense Technology, XIANG PENG, WENHAO LI, SONGJIAN LI, Peking University, HONG GUO, Peking University and National University of Defense Technology, CREAM TEAM — A typical magnetic-resonance scheme employs a static bias magnetic field and an orthogonal driving magnetic field oscillating at the Larmor frequency, at which the atomic polarization precesses around the static magnetic field. We demonstrate in a potassium vapor cell the variations of the resonance condition and the spin precession dynamics resulting from the parametric modulation of the bias field, which are in well agreement with theoretical predictions from the Bloch equation. We show that, the driving magnetic field with the frequency detuned by different harmonics of the parametric modulation frequency can lead to resonance as well. Also, a series of frequency sidebands centered at the driving frequency and spaced by the parametric modulation frequency can be observed in the precession of the atomic polarization. These effects could be used in different atomic magnetometry applications.

¹This work is supported by the National Science Fund for Distinguished Young Scholars of China (Grant No. 61225003) and the National Natural Science Foundation of China (Grant Nos. 61531003 and 61571018)

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Date submitted: 03 Feb 2017

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