Dark-state resonances observed on the D2 line of potassium

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We report the first observation of sub-natural-width dark resonances of enhanced transparency on the D2 line of potassium, contained in an optical cell with reduced (8mm) dimensions and buffered by 30Torr of Ne. The Potassium vapours are irradiated by a frequency modulated DFB diode laser light (with = 766.7nm and 2MHz bandwidth), and are placed in orthogonal to the light magnetic field scanned around zero value. Very good signal-to-noise ratio and narrow (20kHz) dark resonances are observed and studied in unshielded laboratory environment. The dark resonance formation is related to coherent superposition of the ground-state Zeeman sublevels by respective components of the frequency-modulated light.

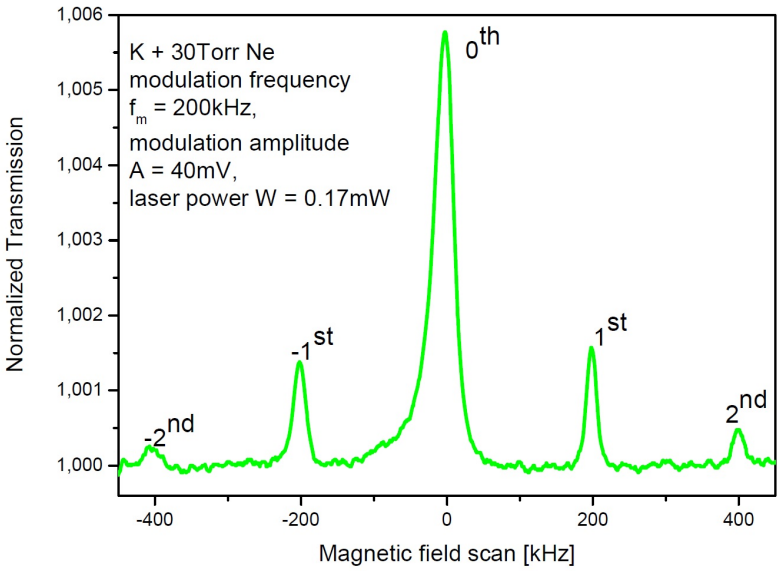

Figure 1. Dark resonances on the D2 line transmission measured as a function of magnetic field. Laser current modulation frequency is fm = 200kHz, modulation amplitude: A = 40mV and light power: W = 0.17mW.

[1] A. Krasteva, S. Gateva, C. Andreeva, G. Alzetta, S. Gozzini, L. Moi, D. Sarkisyan, K. Nasyrov and S. Cartaleva, Dark-state resonances observed on the D2 line of potassium, Proc. of SPIE, **10226**, 102260L (2017).