

Bar Ilan University , Optics Seminar

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Rubidium/Cesium/Potassium optical one-Dimensional nanometric-thin cells applications in Atomic Spectroscopy

Abstract:

The implementation of recently developed technique based on narrowband laser diodes, strong permanent magnets and micro-and nano- thin optical cells make studies of the atomic transitions behavior in an external strong magnetic field simple and robust [1,2].

Particularly, the magnetic field-induced giant modification of probabilities for seven components of $6S_{1/2}, F_g = 3 \rightarrow 6P_{3/2}, F_e = 5$ atomic transition of the Cs D2line, forbidden by selection rules (at zero magnetic field), is observed experimentally for the first time. The applied theoretical model describes very well the experimental curves [3].

So called Hyperfine Paschen Back (HPB) regime has been demonstrated for the Potassium atoms (for the first time) in the presence of strong magnetic field. Important and striking peculiarities of HPB regime for Potassium atoms observed with the help micro-and nano- thin optical cells will be presented.

References

[1] A.Sargsyan,A.Tonoyan,R.Mirzoyan,D.Sarkisyan, A.Wojciechowski,W.Gawlik, Optics Letters, **39**, 2270 (2014).

[2] A. Sargsyan, G. Hakhumyan, R. Mirzoyan, D.Sarkisyan, JETP Letters **98**,441(2013).

[3] A Sargsyan, A Tonoyan, G Hakhumyan, A Papoyan, E Mariotti, D. Sarkisyan, Laser Physics Letters, **11** , 055701 (2014).