Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Magneto-optical resonances and relaxation mechanisms in an extremely thin cell: experiment and theory for the cesium D_1 line[1] MARCIS AUZINSH, ANDRIS BERZINS, RUVIN FERBER, FLORIAN GAHBAUER, ULDIS KALNINS, LINARDS KALVANS, RONALDS RUNDANS, Laser Centre, University of Latvia, Rainis Blvd. 19 LV-1586, Riga, Latvia, DAVID SARKISYAN, Institute for Physical Research, NAS of Armenia, Ashtarak-0203, Armenia — Magneto-optical resonances are a sensitive effect that allows to make stringent tests for theoretical models, which in turn, can help to improve devices that measure magnetic field. The experiments were carried out with an extremely thin cell (ETC) that provides high spatial resolution and allows sub-Doppler spectroscopy. At the same time the theoretical description of the signal requires delicate treatment of effects peculiar to thin cells. The cell, manufactured in Armenia, consists of two YAG glass windows separated by a distance of less than one micrometer. The experimental measurements of magneto-optical resonances were done using LIF signals of a cesium atomic vapor layer with a thickness varying from about 350 nm to of about 900 nm. In this study we obtained an accurate theoretical description of magneto-optical resonances using a theoretical model based on the optical Bloch equations that is an expanded version of earlier models and now includes a more detailed treatment of relaxation processes and the saturation of the atom-laser interaction in the high-intensity areas of the beam.

[1]The Riga group gratefully acknowledges financial support from the Latvian State Research Programme (VPP) project IMIS[2]

Marcis Auzinsh
Laser Centre, University of Latvia, Rainis Blvd. 19 LV-1586, Riga, Latvia

Date submitted: 14 Nov 2014 Electronic form version 1.4