

Belgium Flemish community, Katholieke Universiteit Leuven,
Institute of Electronics, Bulgarian Academy of Sciences

JOINT RESEARCH PROJECT

Confinement of Atomic Vapors in Chiral Optical Metamaterials and Plasmonic
Structures

(Short title: Atomic Vapors in Metamaterials)

Atomic coherence preparation in alkali metal vapor cells for magnetic field measurement

Dimitar Slavov

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**Team: Stefka Cartaleva, Todor Karaulanov, Petko Todorov, Sanka Gateva, Kapka
Vaseva, Christina Andreeva, Nikolai Petrov and Dimitar Slavov**

www.ie-bas.dir.bg

<http://www.magnetometer-ie.bas.bg/>

We studied the effect of Coherent Population Trapping in alkali metal vapor cell, aiming to estimate its potential to build new kind of magnetometers having all-optical sensor. Three approaches have been compared and based on them two prototypes of magnetometers have been built by an international consortium under the V-th EU framework. These magnetometers show very promising results for measuring small (pT-range) fluctuations of the magnetic field against the background of the Earth's magnetic field. The principle of work, the parameters and potential applications of this magnetometer will be discussed.

Different kind of alkali metal vapor cells will be illustrated and there influence on the absorption/fluorescence spectra of the alkali vapor will be discussed.