



ΓΕΝΙΚΟ ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑΤΟΣ ΦΥΣΙΚΗΣ

PHYSICS COLLOQUIUM

Thursday, 11 April 2013

17:00 -18:00

3rd Floor Seminar Room

“Atomic Parity Violation as a Probe of Nuclear and High-Energy Physics”

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Abstract

Measurement of atomic parity violation (APV) at 1% precision or better, in inexpensive table-top experiments, is sensitive to TeV-scale and nuclear physics. However, despite the high potential impact, these APV experiments have proved to be very difficult, with only 2 successful experiments in the past 40 years. I will discuss past, present, and future experimental efforts in APV, with particular emphasis on experiments under construction in our group on Crete. We have developed a new form of cavity-enhanced polarimetry [1], which we believe solves many of the problems of past APV optical-rotation experiments. I will discuss our proposals for APV measurements in isotopes of mercury, xenon, and iodine [1,2].

[1] L. Bougas, G. Katsoprinakis, W. von Klitzing, J. Sapirstein, T.P. Rakitizis, “Cavity-enhanced parity non-conserving optical rotation in metastable Xe and Hg”, Phys. Rev. Lett. 108, 210801 (2012).

[2] G. Katsoprinakis, L. Bougas, T.P. Rakitizis, V. Dzuba, V.V. Flambaum, “Calculation of parity non-conserving optical rotation in iodine at 1315 nm” Phys. Rev. A (in press). <http://arxiv.org/abs/1301.6947>