

DAMOP14-2014-000282

Abstract for an Invited Paper
for the DAMOP14 Meeting of
the American Physical Society

Atomic Clocks, Fundamental Symmetries, and the Search for New Physics

MARIANNA SAFRONOVA, University of Delaware

I will give an overview of theoretical developments related to searches for new physics with atomic systems, including the study of parity violation, search for EDM, and the search for variation of fundamental constants. The study of parity nonconservation in cesium led to a first measurement of the nuclear anapole moment and allowed to place constraints on weak meson-nucleon couplings. I will review the present status of atomic parity violation studies and the implications for searches for physics beyond the standard model and study of weak hadronic interactions. In the second part of my talk, I will discuss the theoretical research related to state-of-the art atomic clock development focusing on the issue of the blackbody radiation shifts as well as application of clocks to the searches for variation of the fine-structure constant.