

Abstract Submitted
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Search for Lorentz symmetry violation with entangled Yb⁺ ions SERGEY PORSEV, University of Delaware, VLADIMIR DZUBA, VICTOR FLAMBAUM, The University of New South Wales, Australia, MARIANNA SAFRONOVA, University of Delaware, THANED PRUTTIVARASIN, Quantum Metrology Laboratory, Japan, MICHAEL HOHENSEE, Lawrence Livermore National Laboratory, HARTMUT HAFFNER, University of California, Berkeley — Recent breakthrough in application of quantum information techniques for test of fundamental physics [T. Pruttivarasin et al., *Nature*, v.517, 592 (2015)] opened a pathway toward improved probes of Lorentz symmetry violation in electron-photon sector. Here, we describe a detailed scheme based on Yb⁺ entangled ions that we find to be the best system for such tests that can be carried out with already existing technologies. We estimate the factor of 2.5×10^4 improvement in Lorentz-violation limits with the new scheme.

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