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Energy shift due to anisotropic black body radiation[1] SERGEY PORSEV, University of Delaware and Petersburg Nuclear Physics Institute, Russia, VICTOR FLAMBAUM, University of New South Wales, Sydney, Australia, MARIANNA SAFRONOVA, University of Delaware, JQI, NIST, and University of Maryland — In many applications a source of the black-body radiation (BBR) can be highly anisotropic. This leads to the black-body radiation shift that depends on tensor polarizability and on the projection of the total angular momentum of ions and atoms in a trap. We derived formula for the anisotropic BBR shift and performed numerical calculations of this effect for Ca^+ and Yb^+ transitions of experimental interest. These ions are used for a design of high-precision atomic clocks, fundamental physics tests such as search for the Lorentz invariance violation and space-time variation of the fundamental constants, and quantum information. Anisotropic BBR shift may be one of the major systematic effects in these experiments.

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