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Electric dipole moment enhancement factor of thallium[1] SERGEY PORSEV, University of Delaware and Petersburg Nuclear Physics Institute, MARIANNA SAFRONOVA, University of Delaware, MIKHAIL KOZLOV, Petersburg Nuclear Physics Institute — A number of extensions of the standard model of particle physics predict electric dipole moments (EDM) of particles that may be observable with the present state-of-the art experiments. The EDMs arise from the violations of both parity and time-reversal invariance. The electron EDM is enhanced in certain atomic and molecular systems. One of the most stringent limits on the electron EDM d_e was obtained from the experiments with ^{205}Tl: $d_e < 1.6\ 10^{-27} e$ cm [Regan *et al.*, PRL **88**, 071805 (2002)]. This result crucially depend on the calculated value of the effective electric field on the valence electron. In the case of Tl this effective field is proportional to the applied field E_0, $E_{\rm eff} = {\rm K}\, E_0$. The goal of this work is to resolve the present controversy in the value of the EDM enhancement factor K in Tl. We have carried out several calculations by different high-precision methods, studied previously omitted corrections, as well as tested our methodology on other parity conserving quantities. We find the EDM enhancement factor of Tl to be equal to $-573(20)$. This value is 20% larger than the recently published result of Nataraj *et al.* [PRL **106**, 200403 (2011)] but agrees very well with several earlier results.

[1]NSF and RFBR

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