

Comment on: “Lorentz violation in high-energy ions” by Santosh Devasia

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Abstract We analyze a recent letter submitted by S. Devasia to EPJ C.

1 Comment

In volume 69 of EPJ C S. Devasia argues [1] that all prior measurements done in the reenactments [2] of the Ives–Stilwell experiment are incorrect. The EPJ C letter first argues that the emitter frequency could differ from the reference frequency due to the Stark and/or Zeeman effects, but then it completely ignores those effects, and pretends to compute a shift from the Doppler effect, based on the baseless premise that the observed frequency in the lab frame equals the reference frequency for the ion at rest. This is incorrect since even the author admits that the frequencies of emitted radiation undergoes relativistic Doppler effect.

An experiment of D. W. MacArthur [3] using a hydrogen beam with a $\beta = 0.84$ is one of the few really high β experiment. With the fourth harmonic of a Nd:YAG laser ($E_0 = 4.66$ eV) the fast hydrogen beam is excited from the ground state $1s$ to state np by using the Doppler effect. The

experimenters found an upper limit for the Mansouri–Sexl parameter $\hat{a} = 2 \cdot 10^{-4}$. Yet, S. Devasia claims a Lorentz violation of the order of β^2 , which is clearly falsified by existent experiments [2, 3]. Such huge violations as implied by S. Devasia would have been detected. In light of the above, the published letter is false.

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