

I realised there may easily arise a discrepancy in the values of some important physical constants and pondered if it might be related to the muon magnetic moment anomaly (unveiled 2021-04-07, <https://muon-g-2.fnal.gov/index.html>).

$a_\mu = \frac{g_\mu}{2} - 1$  as given on <https://www.youtube.com/watch?v=Qn2UQBsGcZ0&t=659s> by Lawrence Krauss:

$$a_{\mu,SM} = 116\,591\,810\,(43) \times 10^{-11}$$

$$a_{\mu,exp} = 116\,592\,061\,(49) \times 10^{-11}$$

difference:  $\Delta a_\mu = 251(59) \times 10^{-11}$

relative anomaly:  $E_\mu = \frac{\Delta a_\mu}{a_{\mu,SM}} \approx 2.15 \times 10^{-6}$

S.I. 2019:  $\alpha \varepsilon_0 = \frac{e^2}{2hc} = \frac{(1.602\,176\,634 \times 10^{-19} \text{ C})^2}{2 \cdot (6.626\,070\,15 \times 10^{-34} \text{ J}\cdot\text{s}) \cdot (299\,792\,458 \text{ m/s})}$   
 $= 6.461\,234\,570\,819\,266 \times 10^{-14} \text{ F/m}$

CODATA 2018:  $\alpha \varepsilon_0 = (7.297\,352\,5693(11) \times 10^{-3}) \cdot (8.854\,187\,8128(13) \times 10^{-12} \text{ F/m})$   
 $= 6.461\,213\,018(2) \times 10^{-14} \text{ F/m}$

relative discrepancy:  $E_{\alpha \varepsilon_0} = \frac{\alpha \varepsilon_0(2018) - \alpha \varepsilon_0(2019)}{\alpha \varepsilon_0(2019)} \approx -3.34 \times 10^{-6}$

We clearly have:  $|E_\mu| < |E_{\alpha \varepsilon_0}|$  Please don't tell me it would be that simple (or silly)...