Looking closer at the U(1)_(B-L) explanation of the ATOMKI nuclear anomalies

Thursday 6 June 2024 17:20 (20 minutes)

We revisit the gauged U(1)B–L explanation of the ATOMKI nuclear anomalies, in which the new gauge boson is the hypothetical X(17) particle. It is known that the vanilla B–L scenario is unable to account for appropriate couplings, namely the suppression of the couplings of X(17) to neutrinos, which motivates adding vector-like leptons. The simplest case, in which the new fields have B–L charges equal to 1, is highly disfavoured since it requires large mixing with the Standard Model fields. One solution recently put forward is to consider large B–L charges to counterbalance small mixing. We show that, in this scenario, and after taking into account several phenomenological constraints, the dominant contribution to the muon anomalous magnetic moment $(g-2)\mu$ is expected to be extremely large and with a negative sign, being thus excluded by experiment.

Primary author:LOPES GONÇALVES, BernardoPresenter:LOPES GONÇALVES, BernardoSession Classification:Parallel Session PII.6