

# 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, Bernardo

**Presenter:** LOPES GONÇALVES, Bernardo

**Session Classification:** Parallel Session PII.6