1972b

"Exotic Muon Capture in Nuclei and Lepton Conservation," M. D. Shuster and M. Rho, *Physics Letters*, Vol. 42B, No. 1, November 13, 1972, pp. 45–48.

This work developed an upper limit for the isotensor weak coupling constant for the transition $\mu^- \to e^+$, which was allowed under the Konopinski-Mahmoud (multiplicative) lepton-number scheme. Such a transition is impossible in muonic Hydrogen due to the impossibility of the final nuclear charge state. That limitation is not present, however, in the reactions $\mu^- + \Delta^+ \to e^+ + \Delta^-$, $\mu^- + \Delta^{++} \to e^+ + \Delta^o$ or $\mu^- + p \to e^+ + \Delta^-$. The first two reactions were studied by Leonard Kisslinger who, on the basis of current experimental upper limits on the observation of exotic isotensor decays of muonic atoms, determined that the isotensor weak coupling constant might be as large as the usual (isovector) Fermi weak coupling constant. The present work, using the same data, showed that the second reaction had a much larger amplitude and that the isotensor weak coupling constant must be at least three orders of magnitude smaller than the isovector Fermi coupling constant. The Konopinski-Mahmoud lepton number scheme was thereby ruled out. This article continues to be cited regularly.

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