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On the neutron decay

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We present the puzzle of the neutron lifetime, according to which different measurements (bottle and beam methods) deliver different lifetimes. In particular, the bottle method delivers a lifetime which is 8 s shorter than the beam method. At present, the mismatch is at the 4 sigma level. If the mismatch is not due to (yet undiscovered) systematic errors, one should search for theoretical explanations. We then discuss which theoretical solutions have been proposed in the literature and propose a novel one based on the effect of quantum measurements on the lifetime of quantum systems.

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