



Dark Particle Interpretation of the Neutron Lifetime Anomaly

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There is a long-standing discrepancy between the neutron lifetime measured in beam and bottle experiments. We propose to explain this anomaly by a dark decay channel for the neutron, involving a dark sector particle in the final state. If this particle is stable, it is a candidate for dark matter in the cosmos. Its mass is close to the neutron mass, suggesting a connection between dark and baryonic matter. An interesting scenario, that has a decay branching fraction of 1% into a monochromatic photon with energy in the range 0.782 MeV – 1.664 MeV, has been tested experimentally. We describe other avenues for experimental tests, including in scenarios of fully dark decays. We construct representative microscopic (particle physics) models consistent with all experimental constraints.