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New physics from the first detection of coherent elastic neutrino-nucleus scattering (CEvNS) with Liquid Argon

The CENNS-10 experiment of the COHERENT collaboration has recently reported the first detection of coherent-elastic neutrino-nucleus scattering (CEvNS) in liquid Argon with more than 3σ significance. In this work, we exploit the new data in order to probe various interesting parameters which are of key importance to CEvNS within and beyond the Standard Model. A dedicated statistical analysis of these data shows that the current constraints are significantly improved in most cases. We derive a first measurement of the neutron rms charge radius of Argon, and also an improved determination of the weak mixing angle in the low energy regime. We also update the constraints on neutrino non-standard interactions, electromagnetic properties and light mediators with respect to those derived from the first COHERENT-CsI data.

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