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# Constraints on light vector mediators through COHERENT data

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The observation of coherent elastic neutrino-nucleus scattering (CEνNS) performed, in 2017 with cesium iodide and in 2020 with liquid argon by the COHERENT experiment unlocked an innovative and powerful tool to study many and diverse physical phenomena.
CEνNS is a neutral current process induced by the exchange of a Z boson. It thus represents also a sensitive probe for non-standard interactions that are not included in the SM, induced by yet to be discovered neutral vector bosons, particularly if they are light.
We present new constraints on three different models, the so-called universal, B − L and Lμ − Lτ models, involving a yet to be observed light vector Z' mediator, by exploiting the data recently released by the COHERENT Collaboration. We compare the results obtained from a combination of the cesium-iodide and argon data sets with the limits derived from searches in fixed target, accelerator, solar neutrino, and reactor CEνNS experiments, and with the parameter region that could explain the anomalous magnetic moment of the muon. We show that for the universal and the B − L models, the COHERENT data allow us to put stringent limits in the light vector mediator mass, and coupling, parameter space.

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