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Cosmic-ray Neutrino Boosted Dark Matter (ν BDM)

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We propose a novel mechanism of boosting dark matter by cosmic-ray neutrinos. The new mechanism is so significant that the arriving flux of cosmic-ray neutrino boosted dark matter (ν BDM) lighter than $O(1)$ MeV on Earth substantially larger than the one of the cosmic-ray electron boosted dark matter. Therefore, ν BDM can dominantly contribute in direct detection experiments. We derive conservative but still stringent bounds and future sensitivity limits for ν BDM from advanced underground dark matter and neutrino experiments such as XENON1T/nT, LZ, Borexino, and JUNO.

Collaboration name

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