



Contribution ID: 186

Type: **Parallel talk**

Synergy between neutrinoless double-beta decay and cosmology towards the discovery of Majorana neutrinos

Monday 28 August 2023 17:00 (15 minutes)

In this talk we discuss the impact of cosmological measurements on future searches for neutrinoless double-beta decay (0nbb). The fundamental importance of 0nbb for particle physics – in particular for neutrino physics – is well known and many efforts are underway to push the experimental sensitivity to values of the half-life of the process above 10^{27} years. Current cosmological results already allow us to place stringent constraints on Majorana's effective mass, i.e. the electron-type mass of ordinary neutrinos; tighter limits and more precise information are expected in the near future. In this context, we quantify the probability of discovering 0nbb for next-generation experiments by updating and extending a broad line of investigation we have conducted over the years*. We minimize assumptions on unknown parameters, such as Majorana phases, and present a new graphical representation of the results, of relevance to the 0nbb community.

* PRD 90, 033005 (2014) / JCAP 12 (2015) 023 / PRD 100, 073003 (2019) / PRD 103, 033008 (2021) / arXiv:2202.01787 (accepted by RMP)

Submitted on behalf of a Collaboration?

No

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Session Classification: Neutrino and Cosmology

Track Classification: Neutrino physics and astrophysics