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Testing the Sterile Baryonic Neutrino with Direct Detection and Spallation Source Experiments

Wednesday, 13 September 2023 17:00 (15 minutes)

In this talk, I will explore the potential for uncovering new neutrino physics through the use of dark matter direct detection experiments and its complementarity with spallation source experiments. In particular, I will analyse the Sterile Baryonic Neutrino Model, an extension of the SM in which we add a sterile massive neutrino. I will show how the sterile neutrino can be generated through the inelastic scattering of an active neutrino with the target material of the previously mentioned experiments, giving rise to a characteristic spectrum. This might allow for a reconstruction of the neutrino mass (in the event of a positive detection), which is limited by the experiment energy threshold and resolution. Direct detection experiments, being sensitive to the solar tau neutrino flux, add extra complementary information that allows to improve the determination of the sterile neutrino couplings and its mass.

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