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Solving the neutrino mass and baryon asymmetry puzzles with experiments at SPS

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The Standard Model cannot explain neutrino masses and oscillations, does not provide a candidate for dark matter particle and does not explain why the universe contains more matter than antimatter. A unified solution of these problems appears if the neutral fermion sector of the Standard Model is constructed in analogy with the structures we have in quarks or in charged leptons. Namely, every left-handed fermion can be required to have its right-handed counterpart. The properties of the new particles - relatively light neutral leptons, can be severely constrained by existing experiments and cosmology. Their mass is expected to be in a few GeV region, while their couplings to ordinary leptons are bounded both from above and from below. We will argue that the dedicated experiments with the use of intensive SPS and PS beams can provide an excellent opportunity for sensitive searches for these new particles.

Summary

The same as abstract

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