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Looking for Baryon Number Violation with HIBEAM/NNBAR Experiment

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The baryon number violation is an essential ingredient for the preferential creation of matter over antimatter needed to account for the observed baryon asymmetry in the Universe. However, a process that violates baryon number has yet to be experimentally observed. The HIBEAM/NNBAR program is a proposed two-stage experiment at the European Spallation Source (ESS) to search for baryon number violation. The program will include high-sensitivity searches for processes that violate baryon number by one or two units: free neutron–antineutron oscillation, neutron–antineutron oscillation via regeneration from a sterile neutron state, and neutron disappearance. The search for free neutrons converting to antineutrons will have a sensitivity improvement of three orders of magnitude compared to the last searches. We will present the recent progress on the experiment, including design studies for the annihilation detector, particle identification and background rejection.

Altas energias

Author: ASEVEDO NEPOMUCENO, Andre (Universidade Federal Fluminense)

Presenter: ASEVEDO NEPOMUCENO, Andre (Universidade Federal Fluminense)

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