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Search for sterile neutrons with the HIBEAM/NNBAR experiment

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As a quasi-stable electrically neutral particle which can be copiously produced, neutrons represent an interesting tool (which is comparatively under-explored) with which feeble interactions with a hidden sector particle could be observed. The HIBEAM/NNBAR experiment is planning a series of searches for neutrons in flight converting into sterile neutrons and/or anti-neutrons at the European Spallation Source in Lund, Sweden. The experiment provides an ultimate sensitivity improvement for baryon number violating processes via neutron conversions of three orders of magnitude compared to the last such search. The experiment can search for such particles via regeneration, disappearance and mediated neutron-antineutron conversions. This talk describes the experiment (the principles of the experiment, apparatus and sensitivity) and has a particular focus on searches for sterile neutrons.

Author: MILSTEAD, David Anthony (Stockholm University (SE))

Presenter: MILSTEAD, David Anthony (Stockholm University (SE))

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