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Poster Session – Submission of Abstract

Submitter and author

Marco Roda
INFN - Padova & Padova University
marco.roda@pd.infn.it

Title of the Poster

NESSiE: an experimental search for sterile neutrinos with the CERN-SPS beam

Abstract

Recent results on neutrino oscillation with Short-Base-Line (SBL) experiments and the re-analysis of past measures, based on the recomputed antineutrino fluxes from nuclear reactors, design a picture not fully compatible with the phenomenological oscillation scenario with 3 neutrinos. A new experimental program is therefore needed to clarify the physics issue with possibly a new SBL neutrino beam at CERN. NESSiE¹ has been proposed for the search of sterile neutrinos studying the leptons produced in CC neutrino and antineutrino interactions. The detectors consist of two magnetic spectrometers to be located in two sites: “Near” and “Far” from the proton target of the CERN-SPS beam. Each spectrometer will be complemented by an ICARUS-like LAr target in order to allow also NC and ν_e CC interactions reconstruction.

Summary

The particular design of the magnetic spectrometers allows to measure the charge and momentum of the muons from few hundreds MeV , using a $0.3 T$ magnetic field in air, up to several GeV measuring the bending and range of the muon in a large $1.5 T$ iron magnet. The characteristics of the two spectrometers will be presented in terms of charge mis-identification, muon momentum measurement and sensitivity of the experiment to the oscillation parameters.

Keywords neutrino oscillations, sterile neutrinos, magnetic spectrometer, muon measurement

¹Neutrino Experiment with SpectrometerS in Europe