

SOX: Short distance neutrino Oscillations with BoreXino

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Borexino, a large volume liquid scintillator detector installed at Gran Sasso laboratory, demonstrated extraordinary sensitivity with respect to neutrino and antineutrino detection, reporting the best up to date results on solar neutrino fluxes below 1 MeV and performing geo-neutrino detection. Energy and position of 1 MeV event in Borexino are reconstructed with a precision of 5% and 14 cm respectively, together with extremely low background this provides an excellent opportunity for the study of short distance neutrino oscillations on the eV mass scale with artificial neutrino sources.

The possible layouts for ^{51}Cr (monoenergetic neutrino) and ^{144}Ce – ^{144}Pr (antineutrino from beta-decay) source experiments in Borexino and the expected sensitivity to sterile neutrinos for three possible different phases of the experiment will be presented. The same set-up can be used to set competitive constraints on neutrino magnetic moment and neutrino non-standard interactions.

Author: Dr SMIRNOV, Oleg (Joint Institute for Nuclear Research)

Presenter: Dr SMIRNOV, Oleg (Joint Institute for Nuclear Research)

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