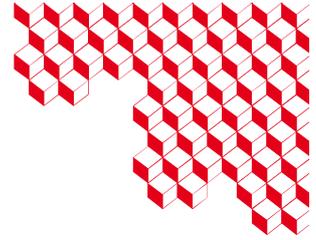




Institut de Recherche sur les lois
Fondamentales de l'Univers



Département de Physique Nucléaire

Séminaire ESNT-DPhN

Lundi 29 janvier 2024 11-12h

Bât 703, room 135 DPhN CEA Saclay, Orme des Merisiers

Marco Martini

IPSA and Sorbonne Université

**Neutrino-nucleus cross sections for neutrino oscillation experiments:
status and challenges**

Neutrino physics has entered an era of high precision. The determination of the neutrino mass ordering and the leptonic CP-violating phase is motivating the present and future neutrino oscillation experiments, which require the control of systematic errors at an unprecedented level of accuracy. One of the major systematics is related to the knowledge of the neutrino-nucleus cross sections since in these experiments nuclear targets are involved.

In the present overview talk, after a brief introduction on neutrino oscillation, I will discuss the current state-of-the-art of the modelling of neutrino-nucleus cross section. I will put special emphasis on quasielastic and multinucleon emission channels which attracted a lot of attention in the last fifteen years and that are crucial for a correct reconstruction of the neutrino energy, hence for a precise determination of the neutrino oscillation parameters. Driven by the aim to stress the strong interplay between theory and experiment in this field, beyond to show many comparisons between theoretical predictions and data, in the final part of the talk I will discuss the theoretical needs in two recent hot topics: the neutrino argon cross sections and the semi-inclusive processes corresponding to the simultaneous detection of the outgoing charged lepton and one or more hadrons in the final state.

This seminar is organized in the framework of the ESNT project:

Meson Exchange Current contributions in semi inclusive lepton nucleus scattering

held at CEA Saclay Orme les Merisiers site, 29th January-2nd February 2024.

<https://esnt.cea.fr/Phocece/Page/index.php?id=117>

<https://esnt.cea.fr>



Contact ESNT: valerie.lapoux@cea.fr - +33 1 69 08 40 83