



東工大 基礎・物性物理学専攻「魅力ある大学院教育イニシアティブ」
FGIP: Foreign Graduate Student Invitation Program
外国人博士課程大学院生の短期招待・共同研究
FGIP-Student Forum セミナー

Tarek Akiri (APC-Paris/CEA-Saclay, France)

日時: 2008年12月18日(木) 16:30~17:30, 場所: 本館 H155B

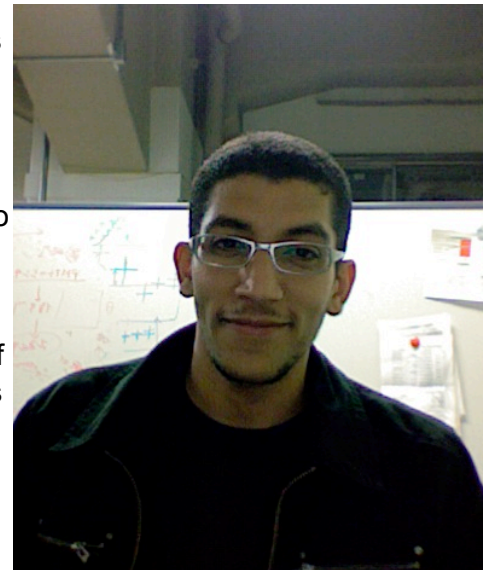
My Contribution to the Double Chooz experiment

Abstract:

The neutrino, first proposed in 1930 by W. Pauli in a desperate try to save the principle of energy conservation, has revealed itself as a very peculiar particle. It has notably generated four Nobel prizes and certainly many others to come...

One of the main current issues in Physics is to determine why our Universe is made only of matter. The CP violation in the quark sector is not enough to explain it by several orders of magnitude and naturally, the next step is to assess the leptonic mixing sector. To precisely measure the leptonic CP violation in the future, we should first determine the last unknown parameter of the PMNS matrix characterising the neutrino oscillation. The so-called θ_{13} parameter, also the key parameter to access the three-neutrino mixing is currently bound by the past CHOOZ experiment: $\sin^2 2\theta_{13} \leq 0.12$ (90% C.L.). The Double Chooz experiment, which takes place in France, is designed to measure the last unknown θ_{13} or to further lower this limit if no signal is observed. To achieve this purpose, the detector design has been reviewed to reduce the backgrounds and a concept of two detectors has been introduced: one close to the power plant to monitor the neutrino flux of electronic antineutrinos emitted by the power plants and one at 1.05km where the disappearance is expected to be maximal. The sensitivity expected at 90% C.L. is $\sin^2 2\theta_{13} \leq 0.03$ with $\Delta m^2 = 2.5 \times 10^{-3}$ eV after four years of data taking.

During my seminar, I will first present my contributions to the detector optimisation and particularly an analysis on the effects of the introduction of light concentrators on the photomultiplier tubes and secondly, I will present the data acquisition system of the experiment and more precisely my work on the characterisation and test of the Flash-ADCs.



教員、修士課程大学院生の参加も歓迎します。

担当 松原 綱之 (内線2722)

FGIP-Guest student の滞在スケジュール

| 名前 | 大学・研究機関 | 滞在期間 | 受入担当 |
|-------------|------------------------------|--------------|-------|
| Tarek Akiri | APC-Paris/CEA-Saclay, France | 12/7 - 12/20 | 松原 綱之 |

<http://www.phys.titech.ac.jp/kiso/fgip>
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