東工大　基礎・物性物理学専攻「物理学リーダーシップ」
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：**2009年11月12日（木）11:00～12:00,** 場所：**本館 H155B**

My contributions to the Double Chooz reactor neutrino 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 prices 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. Leptonic CP violation could be the main responsible. To assess whether it could be accessible through neutrino oscillations, we must first determine whether the last unknown parameter of the PMNS matrix characterising the neutrino oscillations is non-null. This parameter is called the θ_{13} mixing angle and is currently bounded by the 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 θ_{13} or to further lower this limit if no signal is observed. To achieve this purpose, the detector design has been optimised 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.

In this seminar, I will first present my contributions to the detector optimisation. I will then focus on the details of the data acquisition system of the experiment and more precisely on 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	11/2－11/14	松原　綱之

http://www.phys.titech.ac.jp/leadership/fgip/index.html
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