

Diploma work in applied nuclear physics

Time alignment of neutron detector pairs at JET

Introduction

The fusion group of the Division of Applied Nuclear Physics at Uppsala University is looking for diploma students. The group is operating in Uppsala, Sweden, and has its roots in neutron instrumentation for fusion energy research. The group is involved in various parts of the European fusion research program; the development and data interpretation of several neutron detectors, the [neutron camera at MAST](#), Oxford, as well as the two neutron spectrometers [TOFOR](#) and [MPRu](#), at [JET](#), Oxford; and modelling of fusion plasma behaviour.

The proposed diploma work concerns development work for the TOFOR spectrometer. TOFOR is a time-of-flight spectrometer that measures the time it takes for neutrons to fly between one set of detectors (called "S1") to another set (called "S2"). The flight time is related to the energy of the neutrons. Hence, a measured time-of-flight spectrum is related to the energy spectrum of the neutrons emitted from the plasma. This energy spectrum, in turn, reflects various properties of the fuel ions in the plasma, such as their temperature.

Project description

The data acquisition of TOFOR is currently being updated to a fully digital system. Due to a lack of data acquisition channels, the signals from the second set of detectors are summed and recorded in pairs. In this process we lose information of which of the detectors have recorded an event. We need the events of similar times of flight to arrive to the data acquisition system after the same amount of time. This project will measure the amount of time it takes for each signal of each detector to arrive to the data acquisition system and correct for these time differences. This work will partly be performed at the JET fusion experiment, in England.

Who are we looking for?

- You are interested in electronics
- You love to do hands on work in the lab
- You are interested in doing part of your diploma work abroad, in an international research environment

Contact

If you are interested in this project, please contact Jacob Eriksson (jacob.eriksson@physics.uu.se) or Erik Andersson Sundén (erik.andersson-sunden@physics.uu.se).