

Physics Department Senior Design Project Proposal

Project Mentor: Uwe Greife, 303-273-3618, ugreife@mines.edu
(Name, phone, email)

Project Title: Algorithm Development for Waveform Digitizing Readout of Radiation Detectors

Project Type: [X] Team; Number of students __1-3__ [X] Honors

Objective

(What is the science and/or engineering in this project?)

The nuclear group bought a waveform digitizer to read out neutron detectors. In these detectors events from neutrons can be distinguished from events produced by gammas or electrons through pulse shape analysis. This can be done with a waveform digitizer as long as the appropriate algorithms are developed. This project requires C/C++ knowledge and familiarity with computer hard- and software (LINUX), as the objective is to install the digitizer and develop first simple algorithms for pulse form analysis using standard radiation detectors.

Prior Background

(What is the history of your involvement with this topic, including previous student projects?)

This is the first project related to this instrument.

Student Expectations

(What are the deliverables (in addition to the lab notebook and reports) for the two-semester project?)

Functioning readout of detector and progress in pulse shape discrimination.

Supervision Plan

(Who will be directly interacting with the student(s), you, a post-doc, grad students, or others?)

Uwe Greife (primary contact), Postdoc & Graduate Student (computer/detector help as needed)

Resources

(What equipment, algorithms, and facilities are available, and what will be assembled as part of the project?)

All hardware and software is available. The digitizer card and its software need to be installed in existing computer.

Technical References

(Identify a few key starting points for the student(s); journal citations, prior reports, instruction manuals, etc.)

Digitizer Manual

Knoll: Radiation Detection and Measurement