

Abstract Submitted
for the APR13 Meeting of
The American Physical Society

Computational Simulation of MuSun Electronics Response

SAMUEL CRONK, JEFFREY STROUD, FREDERICK GRAY, Regis University, MUSUN COLLABORATION — We have developed a computer program to simulate time projection chamber signals and the subsequent response of the amplifier chain (preamplifier, shaping amplifier, and baseline restorer) used in the MuSun experiment. A SPICE simulation of the amplifier chain was tuned until it agreed with the response to test pulses recorded with an oscilloscope in the laboratory, and the output of the SPICE simulation was then incorporated into the program. The noise model for the simulated output was also improved. Using the AbsRand library, the noise was modeled with a $1/f^\alpha$ correlation, based on the noise power spectral density for blank waveforms that were collected in a previous run of the experiment. Additionally, a feature was added to simulate the wire chamber used to detect the position of the muon upon entering, and the speed of the program was improved greatly, making it viable for use in generating significant datasets.

Samuel Cronk
Regis University

Date submitted: 11 Jan 2013

Electronic form version 1.4