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Machine Learning for Noise Removal in NEWS-G

Tuesday, 15 February 2022 10:36 (12 minutes)

The NEWS-G experiment searches for low mass dark matter using spherical proportional counters (SPCs). The primary ionization created by a particle interacting with the gas in the SPC drifts towards a central anode. When the ions approach the anode, the electric field becomes strong enough to trigger secondary ionizations, resulting in an amplified detector signal. In this talk I will present preliminary results regarding the application of machine learning techniques for noise removal on these signals. Evaluation of these techniques include tests on simulated pulses with added noise, and quantifying model effects on physics goals such as primary ion counting and energy resolution. Successful implementation of this technique will reduce errors on event measurements (energy, drift time, etc.) and lower the analysis threshold, thereby enabling the experiment to search for lower mass dark matter events.

email address

noah.rowe@queensu.ca

Please select: Experiment or Theory

Experiment

Primary author: ROWE, Noah (Queen's University)

Presenter: ROWE, Noah (Queen's University)

Session Classification: Dark Matter Searches