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Machine Learning for Noise Removal in NEWS-G

Friday, 17 February 2023 20:15 (15 minutes)

In this talk I will present preliminary results regarding the application of machine learning techniques for noise removal on signals from spherical proportional counters (SPCs) with the NEWS-G experiment. In SPC detectors, a primary ionization, created by a particle interacting with the gas, drifts towards a central anode. When ions approach the anode, the electric field becomes strong enough to trigger secondary ionizations, resulting in an amplified detector signal. 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.

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