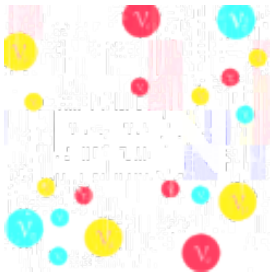

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Use of Advanced Technologies for Teaching and Popularizing Particle Physics: Experiments with the SP5600AN-Premium Version

The SP5600AN –Educational Kit - Premium Version, developed by CAEN, was implemented and characterized as a compact and versatile platform for experimental activities in nuclear and particle physics. The system integrates a SiPM-based detection chain, high-speed waveform digitizers and a set of scintillation detectors optimized for gamma-ray and beta particle spectroscopy, cosmic ray detection, and photon counting applications. Experimental activities included energy calibration and resolution studies with gamma sources and photon statistical distribution studies under low light conditions. The experiments were performed using the HERA acquisition and analysis software, enabling full waveform recording and offline processing. The SP5600AN demonstrated excellent energy resolution for low and medium energy gamma emitters and statistical robustness in single-photon counting experiments. The system's modularity, portability, and reliability validate its suitability for educational training, detector development, and preliminary instrumentation studies in the context of neutrino physics and low-energy particle detection experiments.

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