Abstract

Two Pulse Shape Discrimination (PSD) techniques are proposed based on Cross Correlation (CC) and Principal Component Analysis (PCA). In CC-based PSD, two schemes are proposed to discriminate between different decay scintillation pulses. The first CC-based scheme is applied to digitized scintillation pulses in time-domain with different numbers of samples ranging from the last two samples up to the full length. The second CC-based scheme is applied to frequency components of the scintillation pulses, where pulses are transformed using one of the following transforms; Discrete Sine Transform (DST), Discrete Cosine Transforms (DCT), Discrete Wavelet Transforms (DWT), and Fast Fourier Transform (FFT). On the other hand, in PCA-based PSD technique, two schemes are applied to the digitized pulses in time domain and the transformed pulses coefficients in the frequency domain, respectively, as in the previous
sequence.

References

- Y. Kaschucka and B. Espositob, “Neutron/ γ-ray digital pulse shape discrimination with

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