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CA 94025. *Translation-Invariant Multiwavelet Transforms.*

One of the main tasks of the pipeline integrity industry is the detection and classification of anomalies in pipelines. The signal response from data gathered by a pipeline inspection tool is always contaminated by noise arising from different sources such as superfluous tool movement, system noise, and material noise. This noise reduces the measurement and detection accuracy and impedes the geometric characterization of anomalies. To enhance the signal response, wavelet-based denoising techniques can be employed. One such technique is a hybrid between the redundant continuous wavelet transform and the discrete wavelet transform. This hybrid transform is based on translation invariance, a property not shared by the continuous or discrete wavelet transform. In this presentation, a translation-invariant multiwavelet transform is introduced. It is shown that the associated correlation matrices satisfy a matrix-valued refinement equation implying a hidden basis wavelet representation. Properties of the correlation matrices such as regularity, approximation order, and vanishing moments are presented. The results are illustrated for the DGHM multiwavelet. (Received September 25, 2000)