

Comparative study of defect detection in coarse grains materials

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Abstract : In this work, we propose to develop on the first hand, algorithms based on Split Spectrum Processing (SSP) with Q constant method associated to "Group delay moving entropy" (GDME), on the second hand, we develop a method based on Discrete Wavelet Transform (DWT). These algorithms allow detecting and locating imperfections echoes drowned in the structural noise of materials. The investigation is performed with known defects echoes with different characteristics (position, amplitude, center frequency and bandwidth). The defect echoes frequency is varied around the frequency of the input signal in order to evaluate, by SNR calculation, the robustness of the detection method. The grain noise signal is generated first, by a simple clutter model which consider the noise, in the time domain, as the superimposed of signal coming from backscatterers in the medium and second, experimentally by a material with a coarse grains.

Keywords : Ultrasonic NDE, SSP, DWT, SNR