Deconvolution of closer ultrasonic backscattered echo signals from composite materials

Abdessalem BENAMMAR, Redouane DRAI, Ahmed KECHIDA, Abderrezak GUESSOUM

Abstract : In this paper, we present an approach of deconvolution problem from the estimation of superimposed signals based on the Expectation Maximization Algorithm (EM algorithm) and Maximum Likelihood Estimation. The idea is to decompose the observed data into their signal components and then to estimate separately the parameters of each component signal. This algorithm iterates back and forth using the current estimated parameter in order to decompose the observed data and thus to increase the likelihood of the next estimated parameters. We initially apply this method to simulated signals with additional structural noise. These signals contain several echo defects, closer between them. This stage permits to see the robustness of the developed algorithm. Thereafter, we validate all simulated results by experimental results obtained on composite material with and without delamination defects.