1.3.57. ADVANCED METHOD FOR ULTRASONIC PROBE CHARACTERIZATION

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Each application of ultrasonic testing using angle beam imposes a dedicated periodical probe characterization. Ultrasonic beams generated either by a conventional or by a phased array probe are commonly modeled as a simple line segment. This segment is entirely defined using three essential parameters: the refracted angle, the exit point and the probe delay. These parameters are necessary to locate and to size the detected indications in the required examination volume. The *probe characterization* process is used to calculate these parameters. This can be achieved using several different calculation methods based on measurements of various reflectors such as, for example, infinite planes, half-moons, artificial notches, side drilled holes or flat bottom holes.

Given that the inspection performances are based on a good coverage, on good detection performances and on accurate localization and sizing of the indications, it is crucial to find the best method to calculate these parameters. Hence, in order to automate the entire probe characterization process and to compare the efficiency of several calculation methods, we have developed a specific software called APC (Automated Probe Characterization). Firstly this software treats raw ultrasonic data to calculate the probe parameters using various computation methods. Secondly it computes the average distance between real reflectors positions and relocated ones using the parameters previously calculated. This allowed us to compare the different computation methods implemented and to develop a new advanced method based on results optimization.

The first part of this paper presents the entire characterization process with a particular attention to the APC software. In the second part, the results given by the implemented calculation methods based on theoretical geometric equations and the results given by the new advanced method will be compared and discussed.