Processing of Acousto-Ultrasonic Data for Analysis of Structural Parameters in CFRP Structures

M. MOIX-BONET*, M. BACH**, C. BOLLER*, B. ECKSTEIN**
* Universität des Saarlandes, Saarbrücken, Germany
** EADS, Bremen, Germany

Abstract. This work focuses on the Lamb Wave propagation in a CFRP omega-stringer stiffened panel, specifically on the influence of the structural parameters. The structural influences have already been studied on other stiffened structures, although for different materials and geometries.

For the actuation and sensing a network of bonded piezo ceramic transducer has been used and sealant tape has been applied on the structure surface in order to selectively damp travelling waves at that place. Comparing the wave packet amplitudes in the pristine state with the amplitudes after damping material application it is observable which wave packet have been affected by the presence of damping material at a specific place, giving information about the wave paths.

The selective application of damping material has been used to detect multiple wave path within the panel. By experimental means, A0-mode wave packet travelling through the stringer head and interacting with the stringer feet have been identified. In the S0-mode dominated frequency range a S0-mode wave packet propagating through the stringer head has been detected. Additionally, another wave packet with a velocity corresponding to an A0-mode has been identified, indicating a mode conversion at the stringer feet edges.