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KISSING BONDS MONITORING USING NONLINEAR VIBRO-ACOUSTIC WAVE MODULATIONS

**Wieslaw J. Staszewski, Karol Świercz, Lukasz Pieczonka, Dariusz Broda,
Andrzej Klepka**

*Department of Robotics and Mechatronics,
AGH University of Science and Technology, Poland
w.j.staszewski@agh.edu.pl ; lukasz.pieczonka@agh.edu.pl ; dbroda@agh.edu.pl ;
klepka@agh.edu.pl*

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Summary: The paper reports an application of nonlinear acoustics for kissing bond monitoring in composite structures. Low-frequency modal excitation and high-frequency ultrasonic excitation are used to produce nonlinear modulations in bonded carbon fibre reinforced polymer samples. Low-profile piezoceramic transducers are used for ultrasonic excitation and for measurement of acoustical responses. The work presented focuses on the analysis of damage-related nonlinearities manifested in power spectra as sidebands around carrier high-frequency components. The paper demonstrates that the method can be used for kissing bond detection in composites.