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## **Lamb waves, guided waves in plates**

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In another difficult moment of the world, in 1917, an illustrious English mathematician, Sir Horace Lamb (1849-1934) published his theory on elastic waves that can propagate in plates, which today bears his name. He graduated from Trinity College in Cambridge in 1872 and pursued a teaching career at the Universities of Cambridge (1872-75), Adelaide (1876-85), and Manchester (1885-1920). He taught pure and applied mathematics as well as fluid mechanics. His publications: Hydrodynamics (1895), Elementary course of infinitesimal calculus (1897), Dynamic theory of sounds (1910), Statics (1912), Dynamics (1914), have been highly appreciated and used for many years in the universities. He was a member of the Royal Society since 1884, president of the London Mathematical Society (1902-04) and was knighted in 1931.

Lamb waves began to find practical applications, after 1990, applications facilitated by the use of digital computers. The characteristic equations, established by Sir Horace Lamb, are elegant and simple in appearance. They describe two classes of guided waves: symmetrical and antisymmetrical in relation to the median surface of the plate. Being transcendental equations of complex arguments, solving them has long been a great performance.

Currently, these areas are intensively studied not only in the case of homogeneous and isotropic plates in vacuum, but also in the case of adhesive-bonded multilayer plates, composite plates, etc. Their advantage over other ultrasound inspection techniques is given by their relatively large propagation distances. At high frequencies, of the order of several MHz, the detection of relatively small defects, located at significant distances from the transducer, represents an indisputable advantage for the inspection of panels in the aeronautical, nuclear, and other industries.

At the University Politehnica of Bucharest there is a constant preoccupation for the study of guided waves, Lamb waves in particular, among those involved being the author of these lines. By participating in the conferences organized by the Romanian Acoustics Society, as well as at a number of international conferences, the results of the research carried out on this subject were presented. Numerous works have been published in this field, both in the Romanian Journal of Acoustics and Vibration and in international scientific journals, and a large part of these contributions have been appreciated by specialists in the field, being cited in prestigious journals.

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