

## **ACOUSTICS2008/3105**

### **A computer model to study the properties of guided waves**

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The author's research group has a specialist interest in developing guided wave techniques for the Non Destructive Testing (NDT) of structures. Guided waves travel along the structure and so can be used to inspect large lengths or areas very much faster than the traditional point-by-point ultrasonic methods.

The development of these inspection methods requires careful study and understanding of the properties of the guided waves. To address this need, the author's team has created a general purpose modelling tool. This can model waves in waveguides consisting of an arbitrary number of layers which can be flat or cylindrical, elastic or damped, isotropic or anisotropic solids, or perfect or viscous fluids, and can be immersed in a fluid or embedded in a solid. The primary output of the program is the dispersion curves, that is the frequency-velocity relationships of any modes which could travel in the structure. The program also predicts the attenuation of the modes, caused by leakage into surrounding materials or by material damping, and the mode shapes

The presentation will explain the basis of the modelling tool and illustrate the way in which it can be used to understand the guided waves.