

# **Vibration of elastic plates on a free surface**

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## **ABSTRACT**

Hydroelasticity is the study of the vibration of elastic structures in the presence of water. This field has been the subject of a great deal of research in the last thirty years, motivated by modelling sea ice and by the construction of ever larger ships and other floating structures.

In this talk I will present a solution for a very simple canonical problem, the motion of an elastic beam of variable thickness. Firstly, the equations for fluid flow and for an Euler beam will be presented. I will then show how to determine the vibration of a variable beams using variational techniques. Finally it will be shown that the solution for beams floating on the surface of a fluid medium subject to wave forcing, can be found using Green's functions.

Numerical solutions for the above are demonstrated using MATLAB.