

Mathematical modelling of wave interaction with variable ice sheet in the presence of current

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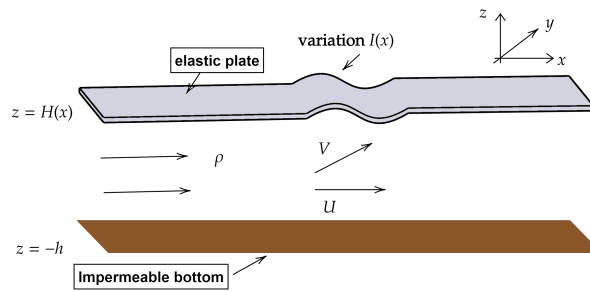


Figure 1: Schematic Diagram

Abstract

We present an asymptotic approach for solving the flexural-gravity wave scattering by varying ice sheet in the presence of uniform current. The interest in this problem lies in developing the first and second order solutions using the Fourier transform method. The Gaussian and Gaussian oscillatory shapes are considered as particular shape of the ice sheet to get the numerical illustrations. The study reveals that there is a Bragg resonance between the flexural-gravity waves and the Gaussian oscillatory plate. The present results will be very useful for variable-geometry VLFS in the maritime environment and the ice sheets in the marginal ice zones for interactions dominated by currents. This study could also assist geologists and marine engineers in developing and maintaining ports and harbour infrastructure.