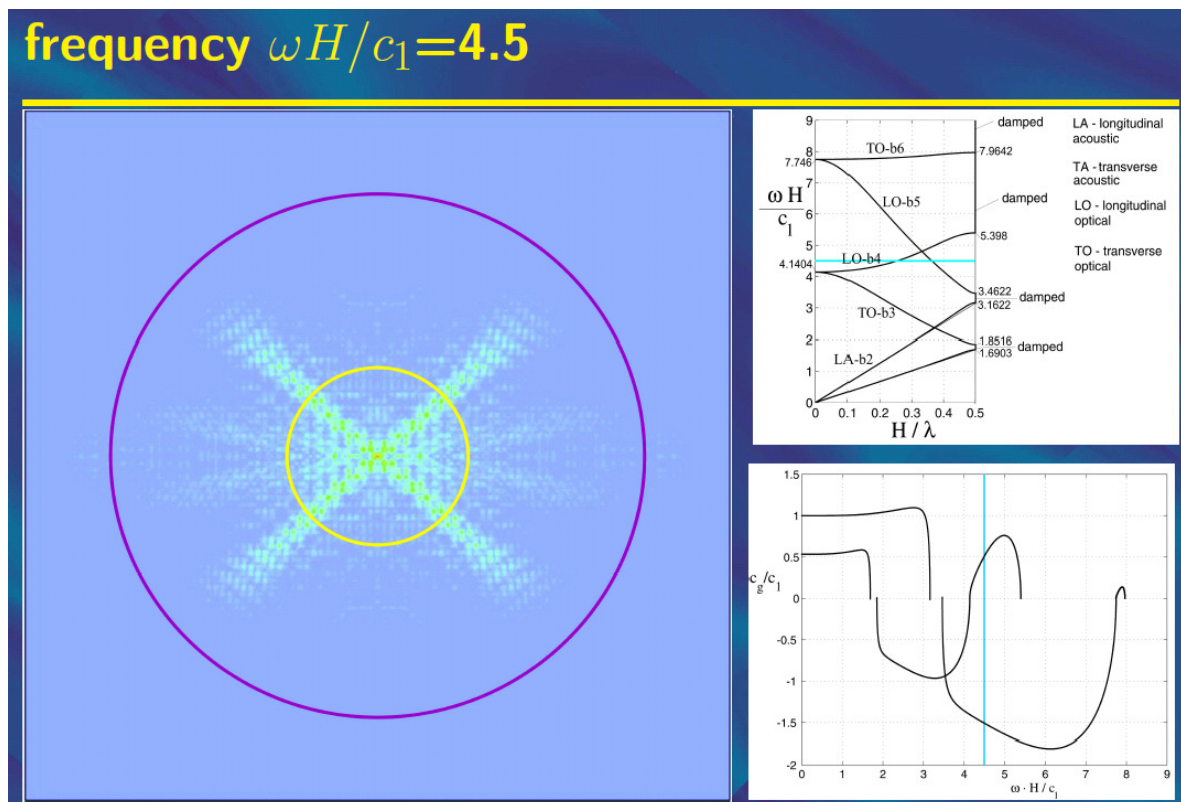


# ACCURACY, STABILITY AND MASS LUMPING OF SERENDIPITY FINITE ELEMENTS IN WAVE PROPAGATION PROBLEMS

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Spatial discretization of a continuum introduces dispersion error to a numerical solution of wave propagation. In the introduction, review is made of fundamental approaches used to derive the truncation error of the finite element method in a dynamic analysis, valid for elements with linear shape functions. In the second part, recent results accomplished by the author and his coworkers are summarized, namely the extension of dispersion theory to quadratic finite elements, following the lines of reasoning introduced by Belytschko and Mullen (1978) for one-dimensional elements and those of Abboud and Pinsky (1992), concerning the scalar Helmholtz equation. Illustrative examples, including numerical modelling of wave patterns travelling in the split-Hopkinson pressure bars, are presented.

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