STATIK DYNAMIK

FINITE ELEMENT METHODS IN LINEAR STRUCTURAL MECHANICS

Accurate Numerical Solutions of Structural Dynamics and Wave Propagation

Problems Based on New Dispersion-Reduction Technique and New Two-stage Time-integration Technique

Prof. Alexander Idesman

Department of Mechanical Engineering,
Texas Tech University

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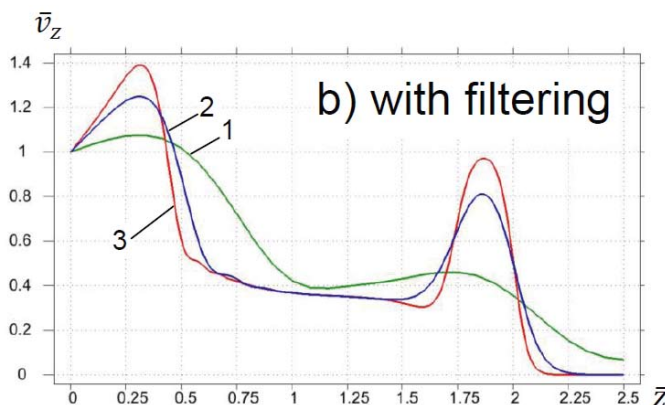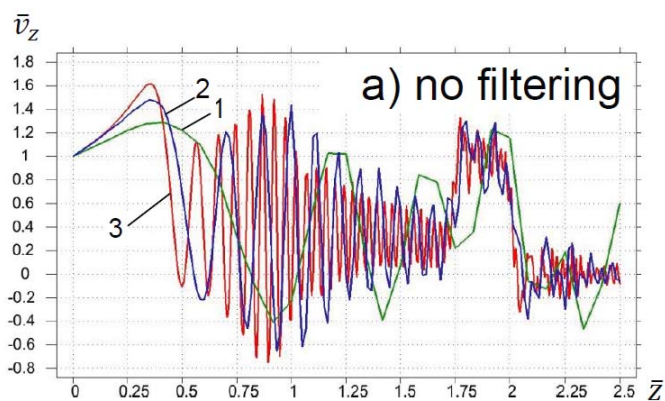**Location:**   IA 6/21

Abstract:

Figure: The distribution of the dimensionless axial velocity $\bar{v}_z$

A new numerical approach for computer simulation of the dynamic response of linear elastic structures is suggested. The new technique is very general and resolves the issues: a) large dispersion error of space-discretization methods, b) lack of reliable numerical techniques; c) treatment of the error accumulation; d) selection of an effective time-integration method; e) selection of the size of a ime increment; f) increase in accuracy and reduction of computation time.

Two main components are included: a) a new dispersion reduction technique for linear finite elements based on the extension of the modified integration rule method to elastodynamics problems; b) a new two-stage time-integration technique with the filtering stage.

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