Effective Computation of Restoring Force Vector in Finite Element Method

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Abstract: We introduce a new way of computation of time dependent partial differential equations using hybrid method FEM in space and FDM in time domain and explicit computational scheme. The key idea is quick transformation of standard basis functions into new simple basis functions. This new way is used for better computational efficiency. We explain this way of computation on an example of elastodynamic equation using quadrilateral elements. However, the method can be used for more types of elements and equations.

Keywords: FEM; stiffness matrix; restoring force vector; computational efficiency of algorithm; e-invariants;

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