

English summaries

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About buckling length

Jussi Jalkanen and Matti Mikkola

Summary. Article deals with a possible misunderstanding connected to the definition of buckling length. Problem is that two different bending moment diagrams (ordinary and the one calculated from buckling shape) can be confused and thus one may assume that buckling length can be seen directly from ordinary bending moment diagram. The difference of bending moment diagrams is not emphasized strong enough in strength of materials text books. However practical examples picked from the literature of timber structures show that this mistake has happened too many times.

Key words: buckling, buckling length, distance between bending moment zeros, wooden structures

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Time dependence in least-square finite element method

Jorma Kinnunen and Eero-Matti Salonen

Summary. Some features associated with the time-dependent least-squares finite element method are described. Additionally, a new least-squares finite element version is suggested. It is described in connection with the one-dimensional linear time-dependent convection equation. Von Neumann analysis is performed additionally for two alternative formulations for comparison purposes. Some numerical example results are presented.

Key words: least-squares, time-dependence, finite elements, convection equation

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Variation of area

Eero-Matti Salonen and Mika Reivinen

Summary. The expression for the variation of plane areas is derived using vector calculus. The need for this appears for example in the determination of positions of interfaces between different material phases when the principle of virtual work is applied and the cross-sectional area appears as a kinematical constraint. The differences between the differential and variation of unit vectors is commented on.

Key words: area, variation of area, vector calculus, variation of unit vectors