Finite element vibration analysis of beams, plates and shells

A bibliography (1994–1998)

Jaroslav Mackerle
Linköping Institute of Technology, Department of Mechanical Engineering, S-581 83 Linköping, Sweden

Received 24 February 1999
Revised 29 March 1999

This bibliography lists references to papers, conference proceedings and theses/dissertations dealing with finite element vibration analysis of beams, plates and shells that were published in 1994–1998. It contains 361 citations. Also included, as separated subsections, are vibration analysis of composite materials and vibration analysis of structural elements with cracks/contacts.

1. Introduction

The information is the most valuable, but least valued, tool the professional has. The output of scientific papers is growing and nobody is longer able to be fully up-to-date with all the relevant information. It is also known that a number of channels that researchers/practical engineers have at their disposal for information retrieval increases fast but it is questionable if researchers/practical engineers are willing to spend time for looking for information. It has been pointed out that in engineering, informal knowledge channels are the most frequently used means of obtaining information. Many professionals prefer to rely on personal judgment or on the wisdom of their colleagues whenever they have problems to solve. Hopefully, it is the author's expectation that this bibliography will save time for readers looking for information dealing with subjects described below.

This bibliography provides a list of references on finite element vibration analysis of beams, plates and shells. General solution techniques as well as problem-specific applications are included. The entries have been retrieved from the author's database, MAKEBASE [1,2]. They are grouped into three main sections:

- Beams
- Plates
- Shells

Each main section contains at its end the following two subsections: vibration analysis of *composite* beams, plates and shells; vibration of beams, plates and shells *containing crack/contact*, respectively. The references have been published in scientific journals, conference proceedings, and theses/dissertations between 1994–1998. They are sorted in each category alphabetically according to the first author's name.

2. Beams

The main topics in this category include: developments of beam elements for vibration analysis; linear and nonlinear vibration analyses; free and forced vibrations; random vibrations; in-plane and out-of-plane free vibrations; flexural and longitudinal vibrations; transverse vibrations; torsional vibrations; coupled bending/torsional modes; coupled extensional/flexural/torsional modes; vibration suppression/damping; adaptive methods; error estimation; crack identification from modal response; delamination problems; identification of crack location; elastic and nonlinear elastic foundations; two-parameter elastic foundation.

Types of beams under consideration: simply supported beams; cantilever beams; straight and curved beams; curved beams with shear deformability; curved rods; short beams; slender beams; tapered beams; tapered thin open section beams; deep beams; thin-walled beams; thin-walled beams with nonsymmetric cross section; box beams; flexible latticed beams; lattice girders; layered sandwich beams; channel beams; Timoshenko beams; Bernoulli–Euler beams; Rayleigh–

Shock and Vibration 6 (1999) 97–109
ISSN 1070-9622 / $8.00

Timoshenko beams; beam grillages; beam-columns; beam-plate structures; coupled beams; cracked beams; bonded beams; partially embedded beams.

Materials: elastic; viscoelastic; isotropic; anisotropic; composites; laminated composites; fiber reinforced composites; smart materials.

3. Plates

In this section the following topics are included: developments of plate elements for vibration analysis; linear and nonlinear vibration analyses; free and forced vibrations; random vibrations; flexural vibrations; lateral vibrations; transverse vibrations; thermomechanical vibration analyses; adaptive methods; error estimation; determination of mechanical properties; delamination problems; damage detection; flexible support; elastic foundation; Pasternak foundation; two-parameter elastic foundation.

Types of plates analysed: simply supported and clamped plates; plates with a concentrated mass; thin and thick plates; skewed thick plates; moderately thick plates; plates with a free edge; curved and twisted plates; triangular plates; rectangular plates; circular plates; penta- and heptagonal plates; annular plates; rhombic plates; shear deformable plates; variable thickness plates; trapezoidal plates; L-shaped plates; layered plates; stiffened plates; sandwich plates; cellular plates; plates with a hole; perforated plates; plates with voids; Kirchhoff plates; Mindlin plates; Reissner–Mindlin plates; plate assemblies; beam-plate structures; thin-wall panels; bolted plates; bonded plates; cracked plates.

Materials of plates: isotropic; orthotropic; anisotropic; nonlinear hysteretic; nickel-based and superalloys; composites; laminated composites; fiber-reinforced composites; cross-ply laminates; angle-ply laminates; metal-piezoceramic composites; metal matrix composites; smart materials.

4. Shells

Subjects handled in this last category are: developments of shell elements for vibration analysis; linear and nonlinear vibration analyses; free and forced vibrations; thermally induced vibrations; damping analysis; adaptive methods; error estimation.

Types of analysed shells: free and clamped shells; partially supported shells; thin and thick shells; moderately thick shells; skewed shells; open shells; axisymmetric shells; nearly axisymmetric shells; nonuniform shells; cylinders; thin shallow spherical shells; conical shells; spherical shells; toroidal shells; helicoidal shells; rhombic hypar-shells; variable thickness shells; sandwich shells; perforated shells; stiffened shells; layered shells; shell panels; conical panels; spherical caps; cracked shells.

Materials: isotropic; orthotropic; anisotropic; hyperelastic; composites; laminated composites; fiber reinforced composites; metal matrix composites.

Readers interested in the finite element literature in general are referred to [3] or to the author's Internet Finite Element Book Bibliography (http://www.solid.ikp.liu.se/fe/index.html).

Acknowledgement

The bibliography presented is by no means complete but it gives a comprehensive representation of different finite element applications on the subjects. The author wishes to apologize for the unintentional exclusions of missing references and would appreciate receiving comments and pointers to other relevant literature for a future update.

References

[1] J. Mackerle, MAKEBASE, An information retrieval system in structural mechanics for main-frames and personal computers, *Eng. Comput.* **6** (1989), 178–185.

[2] J. Mackerle, An information retrieval system for finite element and boundary element literature and software, *Eng. Anal. Boundary Elem.* **11** (1993), 177–187.

[3] J. Mackerle, *Finite Element Methods, A Guide to Information Sources*, Elsevier, Amsterdam, 1991.

BIBLIOGRAPHY

Beams

[1] T.J.S. Abrahamsson and J.H. Sallstrom, Spinning finite beam element of general orientation analyzed with Rayleigh–Timoshenko and Saint–Venant theory, *J. of Engineering for Gas Turbines and Power, ASME* **118**(1) (1996), 86–94.

[2] M.A. Ali et al., Influence of linear depth taper on the frequencies of free torsional vibration of a cantilever beam, *Computers and Structures* **51**(5) (1994), 541–545.

[3] E.A. Armanios and A.M. Badir, Free vibration analysis of anisotropic thin-walled closed-section beams, *AIAA J.* **33**(10) (1995), 1905–1910.

[4] J. Avrashi, High order gradient smoothing towards improved C_1 eigenvalues, *Engineering Computations* **12**(6) (1995), 513–528.

[5] A. Benedetti et al., Simple and effective equilibrium models for vibration analysis of curved rods, *J. of Engineering Mechanics, ASCE* **122**(4) (1996), 291–299.

[6] P. Boisse et al., Error estimator for the definition of optimal meshes in modal analysis of beam and shell structures, in: *15th Int. Modal Analysis Conf.*, Orlando, IMAC, 1997, pp. 1551–1557.

[7] J.A. Cafeo et al., Beam element structural dynamics modification using experimental modal relational data, *J. of Vibration and Acoustics, ASME* **117**(2) (1995), 265–271.

[8] Y.K. Cheung and J. Kong, Vibration and buckling of thin-walled structures by a new finite strip, *Thin-Walled Structures* **21**(4) (1995), 327–343.

[9] K. Cohen and T. Weller, Passive damping augmentation for vibration suppression in flexible latticed beam-like space structures, *J. of Sound and Vibration* **175**(3) (1994), 333–346.

[10] T. Conklin and K. Barker, Understanding the nature of beam vibrations in space through the flexbeam experiment, G-342, *Guidance and Control, Advances in Astronautical Science* **92** (1996), 409–428.

[11] S. Corn et al., Transverse vibrations of short beams: finite element models obtained by a condensation method, *J. of Sound and Vibration* **201**(3) (1997), 353–363.

[12] V.H. Cortinez and R.E. Rossi, Vibrations of pretwisted thin walled beams with allowance for shear deformability, in: *4th World Congress on Computational Mechanics*, Buenos Aires, 1998, pp. 228.

[13] M.M. Ettouney et al., Some practical applications of the use of scale independent elements for dynamic analysis of vibrating systems, *Computers and Structures* **65**(3) (1997), 423–432.

[14] S. Finnveden, Spectral finite element analysis of stationary vibrations in a beam-plate structure, *Acustica* **82**(3) (1996), 478–497.

[15] R. Ganesan, Vibration analysis for stability of singular non-self-adjoint beam-columns using stochastic FEM, *Computers and Structures* **68**(5) (1998), 543–554.

[16] A.S. Gendy and A.F. Saleeb, Vibration analysis of coupled extensional/flexural/torsional modes of curved beams with arbitrary thin-walled sections, *J. of Sound and Vibration* **174**(2) (1994), 261–274.

[17] A.S. Gendy and A.F. Saleeb, Vibration analysis of spatially curved thin-walled beams, *J. of Engineering and Applied Science* **44**(6) (1997), 1041–1056.

[18] H. Ghoneim, Fluid-surface damping versus constrained layer damping for vibration suppression of simply supported beams, *Proc. of SPIE* **3045** (1997), 162–172.

[19] K. Grosh and P.M. Pinsky, Design of Galerkin generalized least squares methods for Timoshenko beams, *Computer Methods in Applied Mechanics and Engineering* **132**(1/2) (1996), 1–16.

[20] M.N. Hamdan and L.A. Latif, On the numerical convergence of discretization methods for the free vibrations of beams with attached inertia elements, *J. of Sound and Vibration* **169**(4) (1994), 527–545.

[21] S.M. Hashemi et al., Bernoulli–Euler stiffness matrix approach for vibrational analysis of spinning linearly tapered beams, in: *1997 Int. Gas Turbine and Aeroengine Congress and Exposition*, ASME, 1997, pp. GT-500.

[22] S.M. Hashemi et al., Dynamic finite element (DFE) approach for coupled bending-torsional vibrations of beams, in: *39th Structures, Structural Dynamics and Material Conf. and Exhibition*, Long Beach, Vol. 4, 1998, pp. 2614–2624.

[23] A. Houmat, Flexural and longitudinal vibrations of deep beams by boundary collocation, *European J. of Mechanics, B/Fluids* **13**(2) (1994), 269–276.

[24] A. Houmat, Vibrations of Timoshenko beams by variable order finite elements, *J. of Sound and Vibration* **187**(5) (1995), 841–849.

[25] W.P. Howson et al., Exact natural frequencies for out-of-plane motion of plane structures composed of curved beam members, *Computers and Structures* **55**(6) (1995), 989–995.

[26] Y. Hu et al., A finite element model for static and dynamic analysis of thin-walled beams with asymmetric cross-sections, *Computers and Structures* **61**(5) (1996), 897–908.

[27] F. Ju et al., On the free vibration of stepped beams, *Int. J. of Solids and Structures* **31**(22) (1994), 3125–3137.

[28] S.E.S. Karlsson, A computational device for prescribing incident waves to a structure via a Rayleigh–Timoshenko beam, *J. of Sound and Vibration* **190**(5) (1996), 739–750.

[29] M. Kawakami et al., In-plane and out-of-plane free vibrations of curved beams with variable sections, *J. of Sound and Vibration* **187**(3) (1995), 381–401.

[30] M.Y. Kim et al., Spatial stability and free vibration of shear flexible thin-walled elastic beams. II: Numerical approach, *Int. J. for Numerical Methods in Engineering* **37**(23) (1994), 4117–4140.

[31] M.J. Klausbruckner and R.J. Pryputniewicz, Theoretical and experimental study of coupled vibrations of channel beams, *J. of Sound and Vibration* **183**(2) (1995), 239–252.

[32] J.B. Kosmatka, Stability and natural frequencies of axial-loaded shear-deformable beams using an improved two-node finite element, in: *35th Structures, Structural Dynamics and Material Conf.*, AIAA, 1994, pp. 193–201.

[33] J.B. Kosmatka, An improved two-node finite element for stability and natural frequencies of axial-loaded Timoshenko beams, *Computers and Structures* **57**(1) (1995), 141–149.

[34] A. Krishnan and Y.J. Suresh, A simple cubic linear element for static and free vibration analyses of curved beams, *Computers and Structures* **68**(5) (1998), 473–489.

[35] P.A.A. Laura et al., Free vibrations of beams of bilinearly varying thickness, *Ocean Engineering* **23**(1) (1996), 1–6.

[36] H.H. Lee, Non-linear vibration of a multilayer sandwich beam with viscoelastic layers, *J. of Sound and Vibration* **216**(4) (1998), 601–621.

[37] A.Y.T. Leung and S.G. Mao, Symplectic integration of an accurate beam finite element in non-linear vibration, *Computers and Structures* **54**(6) (1995), 1135–1147.

[38] W.Y. Li and W.K. Ho, A displacement variational method for free vibration analysis of thin walled members, *J. of Sound and Vibration* **181**(3) (1995), 503–513.

[39] Y.H. Lin and Y.K. Tsai, Nonlinear free vibration analysis of Timoshenko beams using the finite element method, *J. of the Chinese Society of Mechanical Engineers* **17**(6) (1996), 609–615.

[40] S.D. Lust et al., Free and forced response of multi-span beams and multi-bay trusses with localized modes, *J. of Sound and Vibration* **180**(2) (1995), 313–332.

[41] M. Mace, Damping of beam vibrations by means of a thin constrained viscoelastic layer: evaluation of a new theory, *J. of Sound and Vibration* **172**(5) (1994), 577–591.

[42] Y. Matsuzaki et al., Vibration of a cantilevered beam during deployment and retrieval: analysis and experiment, *Smart Materials and Structures* **4**(4) (1995), 334–339.

[43] Y. Mou et al., Exact dynamic stiffness matrix for beams of arbitrarily varying cross sections, *Int. J. for Numerical Methods in Engineering* **40**(2) (1997), 233–250.

[44] M. Mukhopadhyay and A.H. Sheikh, Large amplitude vibration of horizontally curved beams: a finite element approach, *J. of Sound and Vibration* **180**(2) (1995), 239–251.

[45] D.C.D. Oguamanam and G.R. Heppler, Effect of rotating speed on the flexural vibration of a Timoshenko beam, in: *13th IEEE Int. Conf. on Robotics and Automation*, Minneapolis, 1996, pp. 2438–2443.

[46] J.S. Peng et al., A semi-analytical approach for solving forced vibration problems based on a convolution-type variational principle, *Computers and Structures* **59**(1) (1996), 167–177.

[47] M.T. Piovan et al., Vibrations of curved I beams with allowance of shear deformability, in: *4th World Congress on Computational Mechanics*, Buenos Aires, 1998, pp. 229.

[48] G. Prathap and R.U. Vinayak, Best-fit performance of a higher-order beam element, *Communications in Numerical Methods in Engineering* **12**(4) (1996), 229–234.

[49] J. Rakowski and P. Wielentejczyk, Vibrations of infinite periodic beams by finite element method, *ZAMM* **76**(S5) (1996), 411–412.

[50] R.E. Rossi et al., Dynamic stiffening of orthogonal beam grillages, *J. of Sound and Vibration* **187**(2) (1995), 281–286.

[51] P.K. Roy and N. Ganesan, Dynamic studies on beams with unconstrained layer damping treatment, *J. of Sound and Vibration* **195**(3) (1996), 417–427.

[52] A.B. Sabir and A. Sfendji, Effect of shear deformations on the natural frequencies of out of plane vibrations of circular beams, in: *Structural Dynamics and Vibration* **PD 64**, ASME, 1994, pp. 51–57.

[53] A.B. Sabir et al., Out of plane natural frequencies of curved beams using strain based finite element, in: *Structural Dynamics and Vibration* **PD 63**, ASME, 1994, pp. 13–18.

[54] A.B. Sabir et al., Strain-based finite element for the out-of-plane vibration of curved beams, *Structural Engineering Review* **7**(1) (1995), 9–13.

[55] D. Sengupta and S. Dasgupta, Static and dynamic applications of a five noded horizontally curved beam element with shear deformation, *Int. J. for Numerical Methods in Engineering* **40**(10) (1997), 1801–1819.

[56] K. Shankar and A.J. Keane, A study of the vibrational energies of two coupled beams by finite element and Green function (receptance) methods, *J. of Sound and Vibration* **181**(5) (1995), 801–838.

[57] Y. Shi and C. Mei, A finite element time domain modal formulation for large amplitude free vibrations of beams and plates, *J. of Sound and Vibration* **193**(2) (1996), 453–464.

[58] M.J. Smith and S.G. Hutton, A perturbation method for inverse frequency modification of discrete, undamped systems, *J. of Applied Mechanics, ASME* **61**(4) (1994), 887–892.

[59] D.B. Stephen and G.P. Steven, Natural frequency error estimation using a path recovery technique, *J. of Sound and Vibration* **200**(2) (1997), 151–165.

[60] A.L. Stiehl, Power flow analysis of beam members with multiple wave types, *Finite Elements in Analysis and Design* **21**(4) (1996), 253–264.

[61] L.E. Suarez et al., Finite element analysis of beams with constrained damping treatment modeled via fractional derivatives, *Applied Mechanics Reviews* **50**(11) (1997), S216–224.

[62] R. Suresh and S.K. Malhotra, Vibration and damping analysis of thin-walled box beams, *J. of Sound and Vibration* **215**(2) (1998), 201–210.

[63] D. Tan, A common algorithm for random vibration and vibration control analysis of dynamic systems, *Computers and Structures* **57**(1) (1995), 1–13.

[64] M. Tanaka and A.N. Bercin, Finite element modelling of the coupled bending and torsional free vibration of uniform beams with an arbitrary cross-section, *Applied Mathematical Modelling* **21**(6) (1997), 339–344.

[65] C.W.S. To and H.W. Hung, Discrete evolutionary spectra of discretized beams and plates under time-frequency modulated random excitations, in: *1995 ASME Design and Engineering Technology Conf.* **DE 84**, ASME, 1995, pp. 949–954.

[66] A.H. Vermeulen and G.R. Heppler, The B-spline field approximation method applied to beam vibration, in: *Development in Computational Techniques for Structural Engineering*, B.H.V. Topping, ed., Civil-Comp, 1995, pp. 303–318.

[67] A.H. Vermeulen and G.R. Heppler, Predicting and avoiding shear locking in beam vibration problems using B-spline field approximation method, *Computer Methods in Applied Mechanics and Engineering* **158**(3/4) (1998), 311–327.

[68] F. Wang and S. Chen, A method to determine the boundary conditions of the finite element model of a slender beam using measured modal parameters, *J. of Vibration and Acoustics, ASME* **118**(3) (1996), 474–478.

[69] Q.F. Wang, Spline finite member element method for vibration of thin-walled members with shear lag, *J. of Sound and Vibration* **206**(3) (1997), 339–352.

[70] R.T. Wang, Vibration analysis of multispan beams subjected to moving loads using the finite element method, *Trans. of Chinese Institute of Engineering,* Ser C **15**(3) (1994), 229–235.

[71] S. Wojciech and I. Adamiec-Wojcik, Experimental and computational analysis of large amplitude vibrations of spatial viscoelastic beams, *Acta Mechanica* **106**(3/4) (1994), 127–136.

[72] J.S. Wu and J.M. Chen, Dynamic analysis of spatial beam-like lattice girders, *Computers and Structures* **53**(4) (1994), 961–981.

[73] J.S. Wu and H.M. Chou, Free vibration analysis of a cantilever beam carrying any number of elastically mounted point masses with the analytical-numerical method, *J. of Sound and Vibration* **213**(2) (1998), 317–332.

[74] S. Yang and R.F. Gibson, Integration of vibration testing and FEA for estimating dynamic mechanical properties of cantilever beam samples, *Experimental Techniques* **20**(6) (1996), 21–24.

[75] P. Zeng, Composite element method for vibration analysis of structure, Part II: C_1 element (beam), *J. of Sound and Vibration* **218**(4) (1998), 659–696.

[76] S.J. Zhou and X. Zhu, Analysis of effect of dead loads on natural frequencies of beams using finite element techniques, *J. of Structural Engineering, ASCE* **122**(5) (1996), 512–516.

Composite beams

[77] H. Abramovich et al., Vibrations of multi-span non-symmetric composite beams, *Composite Engineering* **5**(4) (1995), 397–404.

[78] E.A. Armanios and A.M. Badir, Free vibration analysis of anisotropic thin-walled closed-section beams, in: *35th Structures, Structural Dynamics and Material Conf.*, AIAA, 1994, pp. 164–171.

[79] J.R. Banerjee and F.W. Williams, Free vibration of composite beams- an exact method using symbolic computation, *J. of Aircraft* **32**(3) (1995), 636–642.

[80] P. Bhattacharya et al., Finite element free vibration analysis of smart laminated composite beams and plates, *J. of Intelligent Material Systems and Structures* **9**(1) (1998), 20–28.

[81] D.S. Dancila and E.A. Armanios, The influence of coupling on the free vibration of anisotropic thin-walled closed-section beams, *Int. J. of Solids and Structures* **35**(23) (1998), 3105–3119.

[82] J.J. Epps and R. Chandra, Natural frequencies of rotating composite beams with tip sweep, *J. of the American Helicopter Society* **41**(1) (1996), 29–36.

[83] M.H. Kadivar and S.R. Mohebpour, Finite element dynamic analysis of unsymmetric composite laminated beams with shear effect and rotary inertia under the action of moving loads, *Finite Elements in Analysis and Design* **29**(3/4) (1998), 259–273.

[84] D.K. Maiti and P.K. Sinha, Bending and free vibration analysis of shear deformable laminated composite beams by finite element method, *Composite Structures* **29**(4) (1994), 421–432.

[85] S.R. Marur and T. Kant, Free vibration analysis of fiber reinforced composite beams using higher order theories and finite element modelling, *J. of Sound and Vibration* **194**(3) (1996), 337–351.

[86] S.R. Marur and T. Kant, A higher order finite element model for the vibration analysis of laminated beams, *J. of Vibration and Acoustics, ASME* **120**(3) (1998), 822–824.

[87] S.M. Nabi and N. Ganesan, A generalized element for the free vibration analysis of composite beams, *Computers and Structures* **51**(5) (1994), 607–610.

[88] S.M. Nabi and N. Ganesan, Comparison of beam and plate theories for free vibrations of metal matrix composite pretwisted blades, *J. of Sound and Vibration* **189**(2) (1996), 149–160.

[89] G. Prathap and R.U. Vinayak, Vibrations of laminated beams using higher-order theory, *Advanced Composite Materials* **6**(1) (1996), 33–50.

[90] A.D. Stemple et al., Vibration analysis of rotating composite beams using a finite element model with warping degrees of freedom, *Computational Mechanics* **16**(4) (1995), 258–265.

Vibration of beams containing crack/contact

[91] M. Chati et al., Modal analysis of a cracked beam, *J. of Sound and Vibration* **207**(2) (1997), 249–270.

[92] G.P. Dube and P.C. Dumir, Tapered thin open section beams on elastic foundation – II: Vibration analysis, *Computers and Structures* **61**(5) (1996), 859–869.

[93] T.H. Elmahdy, Effect of transverse cracks on the natural frequencies of laminated composite beams, *J. of Engineering and Applied Science* **44**(3) (1997), 517–532.

[94] A.K. Das and S.S. Dey, Random vibration of beams with localized region of damage, *Computers and Structures* **51**(1) (1994), 33–38.

[95] R.M. Gadelrab, The effect of delamination on the natural frequencies of a laminated composite beam, *J. of Sound and Vibration* **197**(3) (1996), 283–292.

[96] K.D. Hjelmstad and S. Shin, Crack identification in a cantilever beam from modal response, *J. of Sound and Vibration* **198**(5) (1996), 527–545.

[97] M. Ieremia et al., Modal analysis of structures using different level of mesh discretization. Axially loaded Timoshenko beam on a viscoelastic foundation, in: *3rd World Congress on Computational Mechanics*, Chiba, Japan, 1994, pp. J4-1.

[98] N.E. Kim and J.H. Griffin, Sensitivity of bonded and composite beams, *J. of Sound and Vibration* **177**(1) (1994), 71–92.

[99] M. Kisa et al., Free vibration analysis of cracked beams by a combination of finite elements and component mode synthesis methods, *Computers and Structures* **67**(4) (1998), 215–223.

[100] M. Krawczuk, Effect of closing cracks in forced vibrations of a cantilever Timoshenko beam, *Machine Dynamics Problems* **9** (1994), 43–58.

[101] M. Krawczuk, Coupled longitudinal and bending forced vibration of Timoshenko cantilever beam with a closing crack, *J. of Theoretical and Applied Mechanics* **32**(2) (1994), 463–482.

[102] M. Krawczuk and W.M. Ostachowicz, Modelling and vibration analysis of a cantilever composite beam with a transverse open crack, *J. of Sound and Vibration* **183**(1) (1995), 69–89.

[103] M. Krawczuk et al., Modal analysis of cracked, unidirectional composite beam, *Composites*, Part B **28**(5/6) (1997), 641–650.

[104] M. Krawczuk et al., Analysis of natural frequencies of delaminated composite beams based on finite element method, *Structural Engineering and Mechanics* **4**(3) (1996), 243–256.

[105] M. Krawczuk et al., Natural vibration frequencies of delaminated composite beams, *Computer Assisted Mechanics and Engineering Sciences* **3**(3) (1996), 233–243.

[106] A.Y.T. Leung and R.K.L. Su, Fractal two-level finite element method for free vibration of cracked beams, *Shock and Vibration* **5**(1) (1998), 61–68.

[107] N.R. Naidu and G.V. Rao, Vibrations of initially stressed uniform beams on a two-parameter elastic foundation, *Computers and Structures* **57**(5) (1995), 941–943.

[108] N.R. Naidu and G.V. Rao, Free vibration and stability behaviour of uniform beams and columns on nonlinear elastic foundation, *Computers and Structures* **58**(6) (1996), 1213–1215.

[109] B.P. Nandwana and S.K. Maiti, Modelling of vibration of beam in presence of inclined edge or internal crack for its possible detection based on frequency measurements, *Engineering Fracture Mechanics* **58**(3) (1997), 193–205.

[110] B.P. Nandwana and S.K. Maiti, Detection of the location and size of a crack in stepped cantilever beams based on measurements of natural frequencies, *J. of Sound and Vibration* **203**(3) (1997), 435–446.

[111] Y. Narkis, Identification of crack location in vibrating simply supported beams, *J. of Sound and Vibration* **172**(4) (1994), 549–558.

[112] C.P. Ratcliffe and W.J. Bagaria, Vibration technique for locating delamination in a composite beam, *AIAA J.* **36**(6) (1998), 1074–1077.

[113] R. Ruotolo et al., Harmonic analysis of the vibrations of a cantilevered beam with a closing crack, *Computers and Structures* **61**(6) (1996), 1057–1074.

[114] G.W. Sanders et al., Fiber optic vibration sensing and neural networks methods for prediction of composite beam delamination, *Proc. of SPIE* **3041** (1997), 858–867.

[115] M.H.H. Shen and C. Pierre, Free vibrations of beams with a single-edge crack, *J. of Sound and Vibration* **170**(2) (1994), 237–259.

[116] D. Thambiratnam and Y. Zhuge, Free vibration analysis of beams on elastic foundation, *Computers and Structures* **60**(6) (1996), 971–980.

[117] F. Vestroni and D. Capecchi, Damage evaluation in cracked vibrating beams using experimental frequencies and finite element models, *J. of Vibration and Control* **2**(1) (1996), 69–86.

[118] R.P. West and M.N. Pavlovic, Finite element model sensitivity in the vibration of partially embedded beams, *Int. J. for Numerical Methods in Engineering* **44**(4) (1999), 517–533.

[119] T. Yokoyama, Vibration analysis of Timoshenko beam-columns on two-parameter elastic foundations, *Computers and Structures* **61**(6) (1996), 995–1007.

[120] T. Yokoyama and M.C. Chen, Vibration analysis of edge-cracked beams using a line-spring model, *Engineering Fracture Mechanics* **59**(3) (1998), 403–409.

Plates

[121] S.M.B. Alfonso and E. Hinton, Free vibration analysis and shape optimization of variable thickness plates and shells. 1 – Finite element studies, *Computing Systems in Engineering* **6**(1) (1995), 27–46.

[122] D.R. Avalos et al., A general approximate solution of the problem of free vibrations of annular plates of stepped thickness, *J. of Sound and Vibration* **196**(3) (1996), 275–283.

[123] J. Avrashi, High order gradient smoothing towards improved C_1 eigenvalues, *Engineering Computations* **12**(6) (1995), 513–528.

[124] D.V. Bambill et al., Vibrations of a rectangular plate with a free edge in the case of discontinuously varying thickness, *Ocean Engineering* **24**(1) (1997), 45–49.

[125] M. Barik and M. Mukhopadhyay, Finite element free flexural vibration analysis of arbitrary plates, *Finite Elements in Analysis and Design* **29**(2) (1998), 137–151.

[126] O. Beslin and J. Nicolas, A hierarchical functions set for predicting very high order plate bending modes with any boundary conditions, *J. of Sound and Vibration* **202**(5) (1997), 633–655.

[127] C.G. Boay, Frequency analysis of rectangular isotropic plates carrying a concentrated mass, *Computers and Structures* **56**(1) (1995), 39–48.

[128] F.B. Castro et al., Assessing modal converge for plates formulated within the frame of parametrized variational principles (PVP), in: *4th World Congress on Computational Mechanics*, Buenos Aires, 1998, pp. 79.

[129] T.P. Chang, Random vibration analysis of non-linear hysteretic plates, *J. of Sound and Vibration* **172**(4) (1994), 539–547.

[130] T.P. Chang and H.C. Chang, Vibration and buckling analysis of rectangular plates with nonlinear elastic end restraints against rotation, *Int. J. of Solids and Structures* **34**(18) (1997), 2291–2301.

[131] A. Chate and K. Makinen, Plane finite element for static and free vibration analysis of sandwich plates, *Mechanics of Composite Materials and Structures* **30**(2) (1994), 168–176.

[132] D.Y. Chen and B.S. Ren, Finite element analysis of the lateral vibration of thin annular and circular plates with variable thickness, *J. of Vibration and Acoustics, ASME* **120**(3) (1998), 747–752.

[133] T.Y. Chen et al., Free vibrations of a partially clamped trapezoidal plate, *Experimental Mechanics* **35**(1) (1995), 49–54.

[134] W. Chen and Y.K. Cheung, The non-conforming nine-parameters triangular element for thin plate bending and vibration analysis, in: *COCMSGE*, P.K.K. Lee et al., eds., Hong Kong, 1994, pp. 1580–1583.

[135] W. Chen. and Y.K. Cheung, Refined triangular discrete Kirchhoff plate element for thin plate bending, vibration and buckling analysis, *Int. J. for Numerical Methods in Engineering* **41**(8) (1998), 1507–1525.

[136] N.H. Farag and J. Pan, Free and forced in-plane vibration of rectangular plates, *J. of the Acoustical Society of America* **103**(1) (1998), 408–413.

[137] S. Finnveden, Spectral finite element analysis of stationary vibrations in a beam-plate structure, *Acustica* **82**(3) (1996), 478–497.

[138] K. Gerdes and C. Schwab, Hierarchic models of vibration problems on thin domains, *ZAMM* **78**(S3) (1998), 915–916.

[139] S.S.A. Ghazi, Determination of natural frequencies of regular polygonal plates of nonuniform thickness, *Alexandria Engineering J.* **37**(1) (1998), D7–18.

[140] S.S.A. Ghazi et al., Free vibration analysis of penta, heptagonal shaped plates, *Computers and Structures* **62**(2) (1997), 395–407.

[141] S.J. Guo et al., Vibration analysis of stepped thickness plates, *J. of Sound and Vibration* **204**(4) (1997), 645–657.

[142] R.H. Gutierrez et al., Fundamental frequency of transverse vibration of simply supported and clamped plates of regular polygonal shape with a concentric support, *J. of Sound and Vibration* **217**(5) (1998), 945–949.

[143] W. Han and M. Petyt, Geometrically nonlinear vibration analysis of thin, rectangular plates using the hierarchical FEM – I: The fundamental mode of isotropic plates, *Computers and Structures* **63**(2) (1997), 295–308.

[144] T. Hasebe et al., Vibration of nickel-base single crystal and directionally solidified superalloy plates, *JSME Int. J.*, Ser A **37**(4) (1994), 481–487.

[145] T.P. Holopainen, Finite element free vibration analysis of eccentrically stiffened plates, *Computers and Structures* **56**(6) (1995), 993–1007.

[146] A. Houmat, An alternative hierarchical finite element formulation applied to plate vibrations, *J. of Sound and Vibration* **206**(2) (1997), 201–215.

[147] D.L. Kaap et al., Natural frequencies of plates with uniform perforations, in: *16th Int. Modal Analysis Conference*, Santa Barbara, 1998, pp. 1061–1067.

[148] O. Kawakami, Characteristics of natural frequency of rectangular plates with a circular hole and many points restrained at the edges, *Trans. of the Japan Society of Mechanical Engineers*, Ser C, **61**(581) (1995), 1–8.

[149] A.A. Lakis and A. Selmane, Classical solution shape functions in the finite element analysis of circular and annular plates, *Int. J. for Numerical Methods in Engineering* **40**(6) (1997), 969–990.

[150] D. Larsson, In-plane modal testing of a free isotropic rectangular plate, *Experimental Mechanics* **37**(3) (1997), 339–343.

[151] P.A.A. Laura et al., Effect of Poisson's ratio on the fundamental frequency of transverse vibration and buckling load of circular plates with variable profile, *Applied Acoustics* **47**(3) (1996), 263–273.

[152] J.M. Lee and K.C. Kim, Vibration analysis of rectangular isotropic thick plates using Mindlin plate characteristic functions, *J. of Sound and Vibration* **187**(5) (1995), 865–877.

[153] C.F. Liu and G.T. Chen, A simple finite element analysis of axisymmetric vibration of annular and circular plates, *Int. J. of Mechanical Sciences* **37**(8) (1995), 861–871.

[154] C.F. Liu and G.T. Chen, Geometrically nonlinear axisymmetric vibrations of polar orthotropic circular plates, *Int. J. of Mechanical Sciences* **38**(3) (1996), 325–333.

[155] S. Lopez et al., An adaptive multigrid solver for plate vibration and buckling problems, *Computers and Structures* **69**(5) (1998), 625–637.

[156] O.G. McGee and T.S. Butalia, Natural vibrations of shear deformable cantilevered skew thick plates, *J. of Sound and Vibration* **176**(3) (1994), 351–376.

[157] O.G. McGee et al., Natural vibrations of shear deformable rhombic plates with clamped and free edge conditions, *Computers and Structures* **53**(3) (1994), 679–694.

[158] O.G. McGee et al., Natural frequencies of shear deformable rhombic plates with clamped and simply supported edges, *Int. J. of Mechanical Sciences* **36**(12) (1994), 1133–1148.

[159] S. Mirza and Y. Alizadeh, Free vibration of partially supported triangular plates, *Computers and Structures* **51**(2) (1994), 143–150.

[160] N. Mukherjee and T. Chattopadhyay, Improved free vibration analysis of stiffened plates by dynamic element method, *Computers and Structures* **52**(2) (1994), 259–264.

[161] S.L. Nayar et al., Axisymmetric free vibrations of internally compressed moderately thick annular plates, *Computers and Structures* **53**(3) (1994), 759–765.

[162] S.L. Nayar et al., Axisymmetric free vibrations of moderately thick annular plates with initial stress, *J. of Sound and Vibration* **178**(4) (1994), 501–511.

[163] N. Nicoletti et al., Finite element calculation of the natural frequencies of a tensioned circular plate, in: *15th Int. Modal Analysis Conf.*, Orlando, IMAC, 1997, pp. 332–335.

[164] B.A. Ovunc, In-plane vibration of plates by p-version of finite element method, in: *Energy Sources Technology Conf. and Exhibition* **PD 70**, ASME, 1995, pp. 113–118.

[165] M. Ozakca and E. Hinton, Free vibration analysis and optimisation of axisymmetric plates and shells I: Finite element formulation, *Computers and Structures* **52**(6) (1994), 1181–1197.

[166] G.V. Rao et al., A finite element free vibration analysis of a thermally stressed spinning plate, *Computers and Structures* **59**(2) (1996), 377–385.

[167] J. Ravinger, Vibration of an imperfect thin-walled panel- Part 2: Numerical results and experiment, *Thin-Walled Structures* **19**(1) (1994), 23–36.

[168] L.V.A. Rebillard and J.L. Guyader, Network vibratory behavior of assembled plates, *J. of Physics* **4**(5) (1994), 121–124.

[169] P. Ribeiro and M. Petyt, Nonlinear vibration of plates by the hierarchical finite element and continuation methods, *Int. J. of Mechanical Sciences* **41**(4/5) (1999), 437–459.

[170] R.E. Rossi et al., Transverse vibrations of a rectangular cantilever plate with thickness varying in a discontinuous fashion, *Ocean Engineering* **23**(3) (1996), 271–276.

[171] A.B. Sabir and G.T. Davies, Vibration of square plates containing eccentric holes, *ASME Asia Congress and Exhibition*, Singapore, ASME, 1997, pp. AA-97.

[172] A.B. Sabir and G.T. Davies, Vibration and buckling of square plates containing central holes, *ASME Asia Congress and Exhibition*, Singapore, ASME, 1997, pp. AA-96.

[173] A.B. Sabir and G.T. Davies, Natural frequencies of square plates with reinforced central holes subjected to in-plane loads, *Thin-Walled Structures* **28**(3/4) (1997), 337–353.

[174] A.B. Sabir and G.T. Davies, Natural frequencies of plates with square holes when subjected to in-plane uniaxial, biaxial or shear loading, *Thin-Walled Structures* **28**(3/4) (1997), 321–335.

[175] A.B. Sabir and M.S. Djoudi, Natural frequencies of stiffened plates by the finite element method, in: *Energy Sources Technology Conf. and Exhibition* **PD 70**, ASME, 1995, pp. 159–165.

[176] O. Saijo and H. Eto, Natural frequency analysis of elastic plate, in: *ASME Asia Congress and Exhibition*, Singapore, ASME, 1997, pp. AA-99.

[177] M. Sathyamoorthy, Nonlinear vibrations of plates: an update of recent research developments, *Applied Mechanics Reviews* **49**(10) (1996), S55–62.

[178] K. Shankar, A study of the dynamic stress concentration factors of a flat plate for sea applications, *J. of Sound and Vibration* **217**(1) (1998), 97–111.

[179] Y. Shi and C. Mei, A finite element time domain modal formulation for large amplitude free vibrations of beams and plates, *J. of Sound and Vibration* **193**(2) (1996), 453–464.

[180] R. Solecki, Free-vibration of an L-shaped plate: the general solution and an example of a simply-supported plate with a clamped cutout, *J. of Vibration and Acoustics, ASME* **118**(1) (1996), 107–111.

[181] D.B. Stephen and G.P. Steven, Error estimation for natural frequency analysis using plate elements, *Engineering Computations* **14**(1) (1997), 119–134.

[182] A.G. Striz et al., Free vibration of high-accuracy plate elements by the quadrature element method, in: *36th Structures, Structural Dynamics and Material Conf.*, New Orleans, AIAA, 1995, pp. 1619–1627.

[183] K. Szabelski and T. Kazmir, Comparative analysis of constructional parameters and three-layered plate support influence on free vibration frequencies, *J. of Theoretical and Applied Mechanics* **33**(1) (1995), 171–185.

[184] H. Takabatake et al., Simplified analysis of circular plates including voids, *Computers and Structures* **58**(2) (1996), 263–275.

[185] H. Takabatake et al., A simplified analysis of rectangular cellular plates, *Int. J. of Solids and Structures* **33**(14) (1996), 2055–2074.

[186] C.W.S. To and H.W. Hung, Discrete evolutionary spectra of discretized beams and plates under time-frequency modulated random excitations, in: *1995 ASME Design and Engineering Technology Conf.* **DE 84**, ASME, 1995, pp. 949–954.

[187] T. Tsuiji et al., Free vibrations of curved and twisted thin plates (fundamental theory), *Trans. of the Japan Society of Mechanical Engineers*, Ser C, **60**(580) (1994), 4073–4078.

[188] T. Tsuiji et al., Free vibration analysis of rotating thin twisted plates, *Trans. of the Japan Society of Mechanical Engineers*, Ser C **61**(592) (1995), 4575–4583.

[189] N. Watanabe et al., Vibration analysis of multiple plates interacting with air, in: *38th Structures, Structural Dynamics and Material Conf.*, Kissimmee, AIAA, 1997, pp. 395–403.

[190] N.E. Wiberg et al., Free vibration analysis of Reissner–Mindlin plates using a linked interpolated mixed element, *Computers and Structures* **52**(5) (1994), 979–986.

[191] C.J. Wilson and D.B. Bogy, An experimental modal analysis technique for miniature structures, *J. of Vibration and Acoustics, ASME* **118**(1) (1996), 1–9.

[192] J.S. Wu and S.S. Luo, Free vibration analysis of a rectangular plate carrying any number of point masses and translational springs by using the quasi-analytical and numerical methods, *Int. J. for Numerical Methods in Engineering* **40**(12) (1997), 2171–2193.

[193] J.S. Wu and S.S. Luo, Use of analytical and numerical combined method in the free vibration analysis of a rectangular plate with any number of point masses and springs, *J. of Sound and Vibration* **200**(2) (1997), 179–194.

[194] Z.Q. Xia, Nonlinear analysis of damped vibration of sandwich plates and shells, Ph.D. Thesis, University of Calgary, 1996.

[195] G. Yang, Effect of cutout on natural frequency of thin plate, *J. of Beijing Institute of Technology* **5**(1) (1996), 7–12.

[196] Y.K. Yong et al., On the accuracy of plate theories for the prediction of unwanted modes near the fundamental thickness shear mode, in: *49th Annual IEEE Int. Frequency Control Symposium*, San Francisco, IEEE, 1995, pp. 755–760.

[197] J.O. Youn et al., Free vibration analysis of a plate with an oblique inelastic line constraint, *KSME Int. J.* **12**(3) (1998), 358–369.

[198] T.H. Young and F.Y. Chen, Non-linear vibration of cantilever skew plates subjected to aerodynamic and in-plane exciting forces, *J. of Sound and Vibration* **182**(3) (1995), 427–440.

[199] C. Zhao and G.P. Steven, A-posteriori error estimator/corrector for natural frequencies of thin plate vibration problems, *Computers and Structures* **59**(5) (1996), 949–963.

Composite plates

[200] P. Amat and D. Gay, Determination of the mechanical characteristics of composite tube and resin epoxy plate by identification of their free vibration modes, *Mecanique Industrielle et Matriaux* **48**(2) (1995), 99–102.

[201] T.J. Anderson and A.H. Nayfeh, Natural frequencies and mode shapes of laminated composite plates: experiments and finite element analysis, *J. of Vibration and Control* **2**(4) (1996), 381–414.

[202] Y. Aoki and G. Ben, Vibrational characteristics of advanced composite laminates with a hole, *Trans. of the Japan Society of Mechanical Engineers*, Ser A **61**(583) (1995), 575–580.

[203] A.L. Araujo et al., Characterization of material parameters of composite plate specimens using optimization and experimental vibrational data, *Composites*, Part B **27**(2) (1996), 185–191.

[204] J. Argyris et al., Nonlinear free vibrations of composite plates, *Computer Methods in Applied Mechanics and Engineering* **115**(1/2) (1994), 1–51.

[205] O. Attia and A. El-Zafrany, A high-order shear element for nonlinear vibration analysis of composite layered plates and shells, *Int. J. of Mechanical Sciences* **41**(4/5) (1999), 461–486.

[206] D.V. Bambill et al., Vibrations of orthotropic, rectangular plates of non-uniform thickness and two adjacent free edges, *J. of Sound and Vibration* **215**(1) (1998), 189–194.

[207] N.S. Bardell et al., Free vibration analysis of thin coplanar rectangular plate assemblies Part I: Theory and initial results for specially orthotropic plates, *Composite Structures* **34**(2) (1996), 129–143.

[208] N.S. Bardell et al., Free vibration analysis of thin coplanar rectangular plate assemblies Part II: Further results for generally orthotropic plates, *Composite Structures* **34**(2) (1996), 145–162.

[209] P. Bhattacharya et al., Finite element free vibration analysis of smart laminated composite beams and plates, *J. of Intelligent Material Systems and Structures* **9**(1) (1998), 20–28.

[210] G.B. Chai, Free vibration of laminated composite plates with a central circular hole, *Composite Structures* **35**(4) (1996), 357–368.

[211] K. Chandrashekhara and M. Kolli, Free vibration of eccentrically stiffened laminated plates, *J. of Reinforced Plastics and Composites* **16**(10) (1997), 884–902.

[212] J. Cunha, Free vibration of composite laminated plates by using finite element technique with a higher-order theory, *Science and Engineering J.* **6**(2) (1997), 73–81.

[213] R.A. Dandan, Self-consistent dynamical theory of composite laminated plates, Ph.D. Thesis, The Ohio State University, 1994.

[214] S.F.M. De Almeida and J.S. Hansen, Free vibration analysis of composite plates with tailored thermal residual stresses, in: *ASME Int. Mechanical Engineering Congress and Exposition* **AD 55**, ASME, 1997, pp. 183–190.

[215] H. Ding et al., Free axisymmetric vibration of transversely isotropic laminated circular plates, *Acta Mechanica Solida Sinica* **11**(3) (1998), 209–215.

[216] P.S. Frederiksen, Single-layer plate theories applied to the flexural vibration of completely free thick laminates, *J. of Sound and Vibration* **186**(5) (1995), 743–759.

[217] P.S. Frederiksen, Numerical studies for the identification of orthotropic elastic constants of thick plates, *European J. of Mechanics*, *A/Solids* **16**(1) (1997), 117–140.

[218] H. Fukunaga et al., Effects of laminate configurations and bending-torsional coupling on vibration characteristics of cantilevered laminated plates, *Trans. of the Japan Society of Mechanical Engineers*, Ser C **61**(591) (1995), 4168–4174.

[219] A.S. Gendy et al., Free vibrations and stability analysis of laminated composite plates and shells with hybrid/mixed formulation, *Computers and Structures* **63**(6) (1997), 1149–1163.

[220] A.K. Ghosh and K.C. Biswal, Free-vibration analysis of stiffened laminated plates using higher-order shear deformation theory, *Finite Elements in Analysis and Design* **22**(2) (1996), 143–161.

[221] A.K. Ghosh and S.S. Dey, Free vibration of laminated composite plates- a simple finite element based on higher order theory, *Computers and Structures* **52**(3) (1994), 397–404.

[222] M. Guo and I.E. Harik, Free vibration of stiffened composite laminates, in: *11th Conf. on Engineering Mechanics*, Fort Lauderdale FL, ASCE, 1996, pp. 1163–1166.

[223] W. Han and S.M. Dickinson, Free vibration of symmetrically laminated skew plates, *J. of Sound and Vibration* **208**(3) (1997), 367–390.

[224] W. Han and M. Petyt, Linear vibration analysis of laminated rectangular plates using the hierarchical finite element method – I. Free vibration analysis, *Computers and Structures* **61**(4) (1996), 705–712.

[225] W. Han and M. Petyt, Linear vibration analysis of laminated rectangular plates using the hierarchical finite element method – II: Forced vibration analysis, *Computers and Structures* **61**(4) (1996), 713–724.

[226] W. Han and M. Petyt, Geometrically nonlinear vibration analysis of thin, rectangular plates using the hierarchical FEM – III: 1st mode of laminated plates and higher modes, *Computers and Structures* **63**(2) (1997), 309–318.

[227] R.S. Harichandran and M.K. Naja, Random vibration of laminated composite plates with shear nonlinearity, in: *10th Conf. on Engineering Mechanics*, Boulder, ASCE, 1995, pp. 62–65.

[228] R.S. Harichandran and M.K. Naja, Random vibration of laminated composite plates with material non-linearity, *Int. J. of Non-Linear Mechanics* **32**(4) (1997), 707–720.

[229] S.Y. He et al., A uniformizing method for the free vibration analysis of metal-piezoceramic composite thin plates, *J. of Sound and Vibration* **217**(2) (1998), 261–281.

[230] B.G. Hu et al., Prediction of natural modes of laminated composite plates by a finite element technique, *J. of Sound and Vibration* **181**(5) (1995), 839–850.

[231] S. Huang, Non-linear vibration of a hinged orthotropic circular plate with a concentric rigid mass, *J. of Sound and Vibration* **214**(5) (1998), 873–883.

[232] S.J. Jalali and F. Taheri, An analytical solution for cross-ply laminates under cylindrical bending based on through-the-thickness inextensibility. Part II- Vibrations, *Int. J. of Solids and Structures* **35**(14) (1998), 1575–1587.

[233] R.K. Kapania and P. Mohan, Static, free vibration and thermal analysis of composite plates and shells using a flat triangular shell element, *Computational Mechanics* **17**(5) (1996), 343–357.

[234] A. Karmakar and P.K. Sinha, Finite element free vibration analysis of rotating laminated composite pretwisted cantilever plates, *J. of Reinforced Plastics and Composites* **16**(16) (1997), 1461–1491.

[235] H. Katori and T. Nishimura, Vibration and dynamic stability of anisotropic plates (free vibration and panel flutter), *JSME Int. J.*, Ser C **37**(1) (1994), 28–32.

[236] P.A.A. Laura et al., Vibrations of orthotropic, circular annular plates of non-uniform thickness and a free inner edge, *J. of Sound and Vibration* **218**(1) (1998), 159–163.

[237] D.M. Lee and I. Lee, Vibration analysis of anisotropic plates with eccentric stiffeners, *Computers and Structures* **57**(1) (1995), 99–105.

[238] D.M. Lee and I. Lee, Vibration analysis of stiffened laminated plates including thermally postbuckled deflection effect, *J. of Reinforced Plastics and Composites* **16**(12) (1997), 1138–1154.

[239] I. Lee et al., Vibration and flutter analysis of stiffened composite plate considering thermal effect, in: *ASME Int. Mechanical Engineering Congress and Exposition* **AD 55**, ASME, 1997, pp. 133–141.

[240] L.J. Lee and Y.J. Fan, Bending and vibration analysis of composite sandwich plates, *Computers and Structures* **60**(1) (1996), 103–112.

[241] Y.S. Lee and Y.W. Kim, Analysis of nonlinear vibration of hybrid composite plates, *Computers and Structures* **61**(3) (1996), 573–578.

[242] N. Li and S. Mirza, Vibration of antisymmetric angle-ply laminated plates including transverse shear deformation, *Mechanics of Composite Materials and Structures* **2**(2) (1995), 163–175.

[243] C.C. Lin and C.S. Tseng, Free vibration of polar orthotropic laminated circular and annular plates, *J. of Sound and Vibration* **209**(5) (1998), 797–810.

[244] C.F. Liu and C. H. Huang, Free vibration of composite laminated plates subjected to temperature changes, *Computers and Structures* **60**(1) (1996), 95–101.

[245] I.W. Liu, An element for static, vibration and buckling analysis of thick laminated plates, *Computers and Structures* **59**(6) (1996), 1051–1058.

[246] W.H. Liu and C.C. Huang, Free vibrations of thick cantilever laminated plates with step-change of thickness, *J. of Sound and Vibration* **169**(5) (1994), 601–618.

[247] L.X. Luccioni and S.B. Dong, Levy-type finite element analyses of vibration and stability of thin and thick laminated composite rectangular plates, *Composites*, Part B **29**(4) (1998), 459–475.

[248] R.D. Machado and P.A.M. Rojas, A modified local Green's function method approach to the free vibration of laminated plates, in: *4th World Congress on Computational Mechanics*, Buenos Aires, 1998, pp. 241.

[249] D.K. Maiti and P.K. Sinha, Bending, free vibration and impact response of thick laminated composite plates, *Computers and Structures* **59**(1) (1996), 115–129.

[250] S.M. Nabi and N. Ganesan, Comparison of beam and plate theories for free vibrations of metal matrix composite pretwisted blades, *J. of Sound and Vibration* **189**(2) (1996), 149–160.

[251] A.K. Noor et al., Reduced basis technique for evaluating the sensitivity of the nonlinear vibrational response of composite plates, *Computers and Structures* **52**(6) (1994), 1097–1105.

[252] K. Oh and A.H. Nayfeh, High- to low-frequency modal interactions in a cantilever composite plate, *J. of Vibration and Acoustics, ASME* **120**(2) (1998), 579–587.

[253] G.L. Qian et al., A new rectangular plate element for vibration analysis of laminated composites, *J. of Vibration and Acoustics, ASME* **120**(1) (1998), 80–86.

[254] B.S. Ren and D.Y. Chen, Finite element analysis of non-linear axisymmetric vibration of orthotropic annular plates, *Int. J. of Non-Linear Mechanics* **33**(2) (1998), 227–234.

[255] R. Rikards et al., Vibration and damping analysis of laminated composite plates by the finite element method, *Engineering Computations* **12**(1) (1995), 61–74.

[256] R.E. Rossi, Note on a finite element for vibrating thin, orthotropic rectangular plates, *J. of Sound and Vibration* **208**(5) (1997), 864–868.

[257] R.E. Rossi et al., Vibrations of a rectangular orthotropic plate with a free edge: a comparison of analytical and numerical results, *Ocean Engineering* **25**(7) (1998), 521–527.

[258] G.A. Schoeppner et al., Stress-based elastodynamic discrete laminated plate theory, *AIAA J.* **32**(3) (1994), 616–626.

[259] C.A. Shankara and N.G.R. Iyengar, A C_0 element for the free vibration analysis of laminated composite plates, *J. of Sound and Vibration* **191**(5) (1996), 721–738.

[260] Y.C. Shi et al., Finite element method for nonlinear free vibrations of composite plates, *AIAA J.* **35**(1) (1997), 159–166.

[261] L.C. Shiau and T.Y. Wu, Free vibration of buckled laminated plates by finite element method, *J. of Vibration and Acoustics, ASME* **119**(4) (1997), 635–640.

[262] G. Singh et al., Finite element analysis of the non-linear vibrations of moderately thick unsymmetrically laminated composite plates, *J. of Sound and Vibration* **181**(2) (1995), 315–329.

[263] K. Tanaka et al., Free vibration of cantilever laminated annular sector plate, *Trans. of the Japan Society of Mechanical Engineers*, Ser C **62**(600) (1996), 2983–2989.

[264] R. Tenneti and K. Chandrashekhara, Nonlinear vibration of laminated plates using a refined shear flexible element, *Advanced Composite Materials* **4**(2) (1994), 145–160.

[265] A. Tessler et al., Vibration of thick laminated composite plates, *J. of Sound and Vibration* **179**(3) (1995), 475–498.

[266] W.J. Wang and K.C. Lin, Higher-order shear deformable plate strip element for free vibrations of laminated plates, *Proc. of the National Science Council*, Part A **18**(3) (1994), 289–297.

[267] K. Williams and H. Wang, The effect of laminations on the vibrational modes of circular annular plates, *Experimental Mechanics* **36**(2) (1996), 180–186.

[268] J. Zhu, Free vibration analysis of multilayered composite plates and shells with the natural approach, *Computer Methods in Applied Mechanics and Engineering* **130**(1/2) (1996), 133–149.

[269] J. Zhu et al., Modal representation of transient dynamics of laminated plates, *Composite Engineering* **5**(12) (1995), 1477–1487.

[270] Z. Zou and M. Link, Identification of composite material parameters of plates using vibration test data, *Inverse Problems in Engineering* **3**(1/3) (1996), 145–161.

Vibration of plates containing crack/contact

[271] M. Amabili et al., Analysis of vibrating circular plates having non-uniform constraints using the modal properties of free-edge plates: application to bolted plates, *J. of Sound and Vibration* **206**(1) (1997), 23–38.

[272] N.K. Anifantis et al., Vibration of cracked annular plates, *Engineering Fracture Mechanics* **49**(3) (1994), 371–379.

[273] R.W. Campanelli and J.J. Engblom, Effect of delaminations in graphite-PEEK composite plates on modal dynamic characteristics, *Composite Structures* **31**(3) (1995), 195–202.

[274] A. Chate et al., Free vibration analysis of sandwich plates on flexible supports, *Mechanics of Composite Materials and Structures* **2**(1) (1995), 1–18.

[275] C.G. Go et al., Formulation of a super-element for the dynamic problem of a cracked plate, *Communications in Numerical Methods in Engineering* **14**(12) (1998), 1143–1154.

[276] I. Hayashi et al., The theoretical modal analysis of a circular plate with a solid shaft, *J. of Sound and Vibration* **173**(5) (1994), 633–655.

[277] X.H. Jian et al., Damage detection by piezoelectric patches in a free vibration method, *J. of Composite Materials* **31**(4) (1997), 345–359.

[278] F. Ju et al., Free vibration of plates with stepped variations in thickness on non-homogeneous elastic foundations, *J. of Sound and Vibration* **183**(3) (1995), 533–545.

[279] F. Ju et al., Finite element analysis of free vibration of delaminated composite plates, *Composites Engineering* **5**(2) (1995), 195–210.

[280] F. Ju et al., Free vibration of composite plates with delaminations around cutouts, *Composite Structures* **31**(2) (1995), 177–183.

[281] H. Kang et al., Theoretical modal analysis of a circular plate with a solid shaft and a solid cylinder, *Trans. of the Japan Society of Mechanical Engineers*, Ser C **61**(583) (1995), 894–901.

[282] T.C. Ko et al., Vibration of bonded laminated lap-joint plates using adhesive interface elements, *J. of Sound and Vibration* **184**(4) (1995), 567–583.

[283] M. Krawczuk and W.M. Ostachowicz, A finite plate element for dynamic analysis of a cracked plate, *Computer Methods in Applied Mechanics and Engineering* **115**(1/2) (1994), 67–78.

[284] C.C. Lin and T.C. Ko, Free vibration of bonded plates, *Computers and Structures* **64**(1/4) (1997), 441–452.

[285] M.H. Omurtag and F. Kadioglu, Free vibration analysis of orthotropic plates resting on Pasternak foundation by mixed finite element formulation, *Computers and Structures* **67**(4) (1998), 253–265.

[286] M.H. Omurtag et al., Free vibration analysis of Kirchhoff plates resting on elastic foundation by mixed finite element formulation based on Gateaux differential, *Int. J. for Numerical Methods in Engineering* **40**(2) (1997), 295–317.

[287] M.K. Yeh and Y.L. You, Vibration of laminated plates with adhesive joints, *Composite Engineering* **5**(8) (1995), 983–993.

[288] M. Zaman et al., Free vibration analysis of rectangular plates resting on a two-parameter elastic medium, in: *ERES 96*, Thessaloniki, 2, 1995, pp. 583–592.

Shells

[289] T. Aksu, A finite element formulation for free vibration analysis of shells of general shape, *Computers and Structures* **65**(5) (1997), 687–694.

[290] U. Akyuz and A. Ertepinar, Stability and asymmetric vibrations of pressurized compressible hyperelastic cylindrical shells, *Int. J. of Non-Linear Mechanics* **34**(3) (1999), 391–404.

[291] S.M.B. Alfonso and E. Hinton, Free vibration analysis and shape optimization of variable thickness plates and shells. 1 – Finite element studies, *Computing Systems in Engineering* **6**(1) (1995), 27–46.

[292] S. Askraba et al., Study of vibration of thin shallow spherical shells by laser pulse excitation and interferometry, in: *16th Int. Modal Analysis Conf.*, Santa Barbara, 1998, pp. 1510–1515.

[293] N.S. Bardell et al., Free vibration of completely free, open, cylindrically curved, isotropic shell panels, *J. of Sound and Vibration* **207**(5) (1997), 647–669.

[294] N.S. Bardell et al., Free vibration of thin, isotropic, open, conical panels, *J. of Sound and Vibration* **217**(2) (1998), 297–320.

[295] A. Benjeddou and M. Ali Hamdi, A B-spline finite element for the dynamic analysis of sandwich shells of revolution, *Engineering Computations* **13**(2/4) (1996), 240–262.

[296] P. Boisse et al., Error estimator for the definition of optimal meshes in modal analysis of beam and shell structures, in: *15th Int. Modal Analysis Conf.*, Orlando, IMAC, 1997, pp. 1551–1557.

[297] X. Cai, A finite element for the vibration of a rotating shell of revolution, in: *1st Int. Conf. on Engineering Computation and Computer Simulation,* Changsha, China, 1995, pp. 214–219.

[298] D. Chakravorty and J.N. Bandyopadhyay, Effects of release of boundary constraints on the natural frequencies of clamped, thin, cylindrical shells, *Computers and Structures* **52**(3) (1994), 489–493.

[299] D. Chakravorty and J.N. Bandyopadhyay, On the free vibration of shallow shells, *J. of Sound and Vibration* **185**(4) (1995), 673–684.

[300] D. Chakravorty et al., Finite element free vibration analysis of conoidal shells, *Computers and Structures* **56**(6) (1995), 975–978.

[301] J. Chung and J.M. Lee, Vibration analysis of a nearly axisymmetric shell structure using a new finite ring element, *J. of Sound and Vibration* **219**(1) (1999), 35–50.

[302] P. Cousseau et al., Natural frequencies of perforated cylindrical shells, in: *16th Int. Modal Analysis Conf.*, Santa Barbara, 1998, pp. 1054–1060.

[303] S.C. Fan and M.H. Luah, Free vibration analysis of arbitrary thin shell structures by using spline finite element, *J. of Sound and Vibration* **179**(5) (1995), 763–776.

[304] M. Ganapathi and T.K. Varadan, Large amplitude vibrations of circular cylindrical shells, *J. of Sound and Vibration* **192**(1) (1996), 1–14.

[305] P.B. Goncalves and N.R.S.S. Ramos, Numerical method for vibration analysis of cylindrical shells, *J. of Engineering Mechanics, ASCE* **123**(6) (1997), 544–550.

[306] H. Igawa et al., Forced vibrations of rotating circular cylindrical shells, *Trans. of the Japan Society of Mechanical Engineers*, Ser C **61**(586) (1995), 16–20.

[307] N. Iwatsuki et al., Modal analysis of thick cylinder with both ends free based on Mindlin's method, *Trans. of the Japan Society of Mechanical Engineers*, Ser C **60**(571) (1994), 774–780.

[308] J. Jiang and M.D. Olson, Vibration analysis of orthogonally stiffened cylindrical shells using super finite elements, *J. of Sound and Vibration* **173**(1) (1994), 73–83.

[309] R.M. Koch, Three-dimensional vibrations of doubly-skewed, helicoidal, cantilevered thick shells, in: *35th Structures, Structural Dynamics and Material Conf.*, AIAA, 1994, pp. 2563–2571.

[310] A.Y.T. Leung and N.T.C. Kwok, Free vibration analysis of toroidal shell, *Thin-Walled Structures* **18**(4) (1994), 317–332.

[311] M.L. Liu and C.W.S. To, Vibration of structures by hybrid strain-based three-node flat triangular shell elements, *J. of Sound and Vibration* **184**(5) (1995), 801–821.

[312] O.G. Mcgee and S.C. Spry, A three-dimensional analysis of the spheroidal and toroidal elastic vibrations of thick-walled spherical bodies of revolution, *Int. J. for Numerical Methods in Engineering* **40**(8) (1997), 1359–1382.

[313] S. Mirza and Y. Alizadeh, Free vibration of partially supported cylindrical shells, *Shock and Vibration* **2**(4) (1995), 297–306.

[314] J. Missaoui et al., Free and forced vibration of a cylindrical shell with a floor partition, *J. of Sound and Vibration* **190**(1) (1996), 21–40.

[315] M. Ozakca and E. Hinton, Free vibration analysis and optimisation of axisymmetric plates and shells I: Finite element formulation, *Computers and Structures* **52**(6) (1994), 1181–1197.

[316] N.M. Price et al., Vibrations of cylindrical pipes and open shells, *J. of Sound and Vibration* **218**(3) (1998), 361–387.

[317] D.M. Raj et al., Effect of ring stiffeners on vibration of cylindrical and conical shell models, *J. of Sound and Vibration* **179**(3) (1995), 413–426.

[318] T.C. Ramesh and N. Ganesan, Vibration and damping analysis of cylindrical shells with constrained damping treatment – a comparison of three theories, *J. of Vibration and Acoustics, ASME* **117**(2) (1995), 213–219.

[319] C.T.F. Ross, Vibration and elastic instability of thin-walled conical shells under external pressure, *Computers and Structures* **55**(1) (1995), 85–94.

[320] C.T.F. Ross and W. D. Richards, Vibrations of axisymmetric shells under external water pressure, in: *Structural Dynamics and Vibration* **PD 64**, ASME, 1994, pp. 315–325.

[321] C.T.F. Ross et al., Vibration of thin-walled ring-stiffened circular cylinders and cones, *Thin-Walled Structures* **18**(3) (1994), 177–190.

[322] A.B. Sabir, Free vibration steady state response of geometrically nonlinear shallow arches, *Thin-Walled Structures* **18**(2) (1994), 145–159.

[323] A.B. Sabir et al., Strain-based finite element for the natural frequencies of cylindrical shells, *Thin-Walled Structures* **18**(1) (1994), 67–82.

[324] A.B. Sabir et al., Shallow shell element for the natural frequencies of cylindrical shells, in: *Structural Dynamics and Vibration* **PD 63**, ASME, 1994, pp. 5–11.

[325] A.B. Sabir et al., Natural frequencies of cylindrical shells using a shallow-shell finite element, *Structural Engineering Review* **7**(1) (1995), 35–40.

[326] J. Schwarte, Vibrations of corner point supported rhombic hypar-shells, *J. of Sound and Vibration* **175**(1) (1994), 105–114.

[327] G. Sinha and M. Mukhopadhyay, Finite element free vibration analysis of stiffened shells, *J. of Sound and Vibration* **171**(4) (1994), 529–548.

[328] G. Sinha and M. Mukhopadhyay, Static, free and forced vibration analysis of arbitrary non-uniform shells with tapered stiffeners, *Computers and Structures* **62**(5) (1997), 919–933.

[329] K.R. Sivadas, Vibration analysis of pre-stressed rotating thick circular conical shell, *J. of Sound and Vibration* **186**(1) (1995), 99–109.

[330] K.R. Sivadas and N. Ganesan, Effect of rotation on vibration of moderately thick circular cylindrical shells, *J. of Vibration and Acoustics, ASME* **116**(2) (1994), 198–202.

[331] K.R. Sivadas and N. Ganesan, Free vibration and material damping analysis of moderately thick circular cylindrical shells, *J. of Sound and Vibration* **172**(1) (1994), 47–61.

[332] A.J. Stanley and N. Ganesan, Free vibration characteristics of stiffened cylindrical shells, *Computers and Structures* **65**(1) (1997), 33–45.

[333] Z.Q. Xia, Nonlinear analysis of damped vibration of sandwich plates and shells, Ph.D. Thesis, University of Calgary, 1996.

[334] J.S. Yim et al., Free vibration of clamped-free circular cylindrical shell with a plate attached at an arbitrary axial position, *J. of Sound and Vibration* **213**(1) (1998), 75–88.

Composite shells

[335] E.A. Armanios et al., Free vibration of a metal matrix composite shell with circumferential reinforcement, in: *35th Structures, Structural Dynamics and Material Conf.*, AIAA, 1994, pp. 172–181.

[336] O. Attia and A. El-Zafrany, A high-order shear element for nonlinear vibration analysis of composite layered plates and shells, *Int. J. of Mechanical Sciences* **41**(4/5) (1999), 461–486.

[337] M.S. Bouabdallah and J.L. Batoz, Formulation and evaluation of a finite element model for the linear analysis of stiffened composite cylindrical panels, *Finite Elements in Analysis and Design* **21**(4) (1996), 265–289.

[338] D. Chakravorty et al., Free vibration analysis of point-supported laminated composite doubly curved shells – a finite element approach, *Computers and Structures* **54**(2) (1995), 191–198.

[339] D. Chakravorty et al., Finite element free vibration analysis of point supported laminated composite cylindrical shells, *J. of Sound and Vibration* **181**(1) (1995), 43–52.

[340] D. Chakravorty et al., Finite element free vibration analysis of doubly curved laminated composite shells, *J. of Sound and Vibration* **191**(4) (1996), 491–504.

[341] J.S. Chang and J.W. Shyong, Thermally induced vibration of laminated circular cylindrical shell panels, *Composites Science and Technology* **51**(3) (1994), 419–427.

[342] M. Ganapathi and T.K. Varadan, Nonlinear free flexural vibrations of laminated circular cylindrical shells, *Composite Structures* **30**(1) (1995), 33–49.

[343] B.P. Gautham and N. Ganesan, Free vibration analysis of orthotropic thick shells of revolution using discrete layer theory, *J. of Sound and Vibration* **171**(4) (1994), 549–556.

[344] B.P. Gautham and N. Ganesan, Free vibration characteristics of isotropic and laminated orthotropic spherical caps, *J. of Sound and Vibration* **204**(1) (1997), 17–40.

[345] A.S. Gendy et al., Free vibrations and stability analysis of laminated composite plates and shells with hybrid/mixed formulation, *Computers and Structures* **63**(6) (1997), 1149–1163.

[346] S. Goswami and M. Mukhopadhyay, Finite element free vibration analysis of laminated composite stiffened shell, *J. of Composite Materials* **29**(18) (1995), 2388–2422.

[347] P.K. Gotsis and J. D. Guptill, Free vibration of fiber composite thin shells in a hot environment, *J. of Reinforced Plastics and Composites* **14**(2) (1995), 143–163.

[348] K.H. Huang and A. Dasgupta, A layer-wise analysis for free vibration of thick composite cylindrical shells, *J. of Sound and Vibration* **186**(2) (1995), 207–222.

[349] H. Igawa et al., Forced vibration of rotating anisotropic cylindrical shells, *Trans. of the Japan Society of Mechanical Engineers*, Ser C **62**(600) (1996), 2998–3004.

[350] R.K. Kapania and P. Mohan, Static, free vibration and thermal analysis of composite plates and shells using a flat triangular shell element, *Computational Mechanics* **17**(5) (1996), 343–357.

[351] A. Korjakin et al., Analysis of free damped vibrations of laminated composite conical shells, *Composite Structures* **41**(1) (1998), 39–47.

[352] A.A. Lakis et al., Non-linear free vibration analysis of laminated orthotropic cylindrical shells, *Int. J. of Mechanical Sciences* **40**(1) (1998), 27–49.

[353] T.C. Ramesh and N. Ganesan, Orthotropic cylindrical shells with a viscoelastic core: a vibration and damping analysis, *J. of Sound and Vibration* **175**(4) (1994), 535–555.

[354] A. Selmane and A.A. Lakis, Influence of geometric non-linearities on the free vibrations of orthotropic open cylindrical shells, *Int. J. for Numerical Methods in Engineering* **40**(6) (1997), 1115–1137.

[355] A. Selmane and A.A. Lakis, Dynamic analysis of anisotropic open cylindrical shells, *Computers and Structures* **62**(1) (1997), 1–12.

[356] A.V. Singh and V. Kumar, Vibration of laminated shallow shells on quadrangular boundary, *J. of Aerospace Engineering* **9**(2) (1996), 52–57.

[357] K.R. Sivadas, Vibration analysis of pre-stressed thick circular conical composite shells, *J. of Sound and Vibration* **186**(1) (1995), 87–97.

[358] C.W.S. To and B. Wang, Hybrid strain-based three-node flat triangular laminated composite shell elements for vibration analysis, *J. of Sound and Vibration* **211** (2) (1998), 277–291.

[359] Z.C. Xi et al., Free vibration of a laminated composite circular cylindrical shell partially filled with fluid, *Composites*, Part B **28**(4) (1997), 359–374.

[360] J. Zhu, Free vibration analysis of multilayered composite plates and shells with the natural approach, *Computer Methods in Applied Mechanics and Engineering* **130**(1/2) (1996), 133–149.

Vibration of shells containing crack/contact

[361] M. Krawczuk, Rectangular shell finite element with an open crack, *Finite Elements in Analysis and Design* **15**(3) (1994), 233–253.