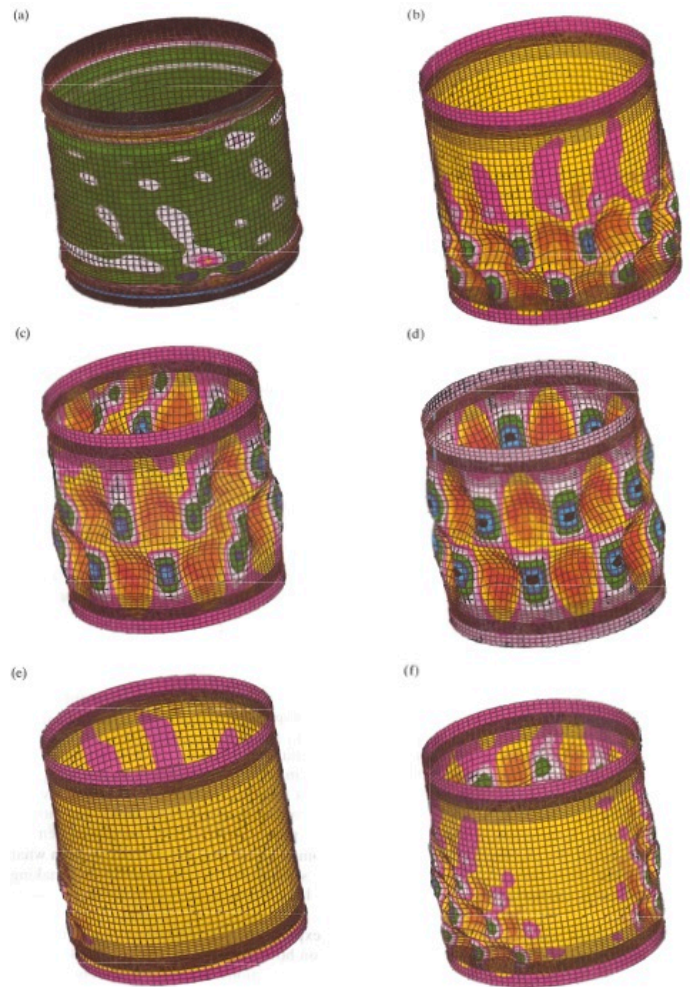




Professor Eduard Riks



From: Eduard Riks, Charles C. Rankin and Francis A. Brogan, "On the solution of mode jumping phenomena in thin-walled shell structures", *Computer Methods in Applied Mechanics and Engineering*, Vol. 136, Nos. 1-2, September 1996, pp. 59-92

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Most known for **“the Riks method”**: a reliable method for tracing nonlinear equilibrium states in load-displacement space with the use of finite element models.

Selected Publications:

W. T. Koiter, "Over de stabiliteit van het elastisch evenwicht", Technische Hooige School, Delft. English translation : Edward Riks (1969), *The stability of elastic equilibrium*. Stanford University, (1945)

Eduard Riks, "On the Numerical Solution of Snapping problems in the Theory of Elastic Stability", Ph.D Thesis, SUDAAR no. 401, Dept. of Aero/Astronautics, Stanford University, Stanford, California. August 1970. (Principal advisor: Nicholas J. Hoff)

Eduard Riks (Department of Aeronautics and Astronautics, Stanford University, California, USA), "The Influence of Periodic Axisymmetric Imperfections of Various Wavelengths on the Buckling Load of a Cylindrical Shell in Axial Compression", March 1971, (un-numbered report in the DTIC citation), DTIC Accession Number: AD0747061

E. Riks, The application of Newton's method to the problem of elastic stability, J. Appl. Mech. 39 (1972) 1060-1066.

Eduard Riks, "The Application of Newton's Method to the Problem of Elastic Stability", Journal of Applied Mechanics, 39, pp. 1060-1066 (1973).

Riks, E., "An incremental approach to the solution of snapping and buckling problems", Int. J. Solids and Structures, Vol. 15, 1979, pp. 529-551, doi:10.1016/0020-7683(79)90081-7

ABSTRACT: This paper is concerned with the numerical solution of systems of equations of discrete variables, which represent the nonlinear behaviour of elastic systems under conservative loading conditions. In particular, an incremental approach to the solution of buckling and snapping problems is explored. The topics that are covered can be summarized as follows:—The computation of nonlinear equilibrium paths with continuation through limit points and bifurcation points.—The determination of critical equilibrium states. Characteristic to the procedures employed is the use of the length of the equilibrium path as control parameter. This feature, together with the second order iteration method of Newton, offers a reliable basis for the procedures described. Actual computations, carried out on a finite element model of a shallow circular arch, illustrate the effectiveness of the methods proposed.

J.F. Besseling, L.J. Ernst, K. Van Der Werff, A.U. De Koning and E. Riks, "Geometrical and physical nonlinearities some developments in The Netherlands", Computer Methods in Applied Mechanics and Engineering, Vols. 17-18, Part 1, January 1979, pp. 131-157, doi:10.1016/0045-7825(79)90085-9

Riks, E., "**Some Computational Aspects of the Stability Analysis of Nonlinear Structures**", Computational Methods in Applied Mechanics and Engineering, Vol. 47, 1984, pp. 219-259, doi:10.1016/0045-7825(84)90078-1

Eduard Riks (Faculty of Aerospace Engineering Delft University of Technology Delft. The Netherlands), "**Buckling Analysis of Elastic Structures: A Computational Approach**", Advances in Applied Mechanics, Vol. 34, 1997, Pages 1-76, doi:10.1016/S0065-2156(08)70319-3

Riks, E., "Progress in Collapse Analysis," Journal of Pressure Vessel Technology, Vol. 109, February 1987, pp. 27-41.

Riks, E. and Rankin, C. C. (1987). Bordered equations in continuation methods :An improved solution technique. NLR MP 87057U, National Aerospace Laboratory, The Netherlands.

Riks, E., "A Finite Strip Method for the Buckling and Postbuckling Analysis of Stiffened Panels in Wing Box Structures," NLR CR 89383L, 1989.

Viz M, Potyondy D, Zehnder A, Rankin C, and Riks E (1995), Computation of membrane and bending stress intensity factors for thin, cracked plates, *International Journal of Fracture* 72, 21–38.

Riks E and denReijer P (1987), Finite element analysis of cracks in a thin walled cylinder under internal pressure, Tech. rep., National Aerospace Laboratory, Amsterdam, Netherlands, report No. NLR–TR–87021–U, NTIS No. PB88–241021.

Eduard Riks and Charles C. Rankin, “Sandwich modeling with an application to the residual strength analysis of a damaged compression panel”, *International Journal of Non-Linear Mechanics*, Vol. 37, Nos 4-5, June 2002, pp. 897-908, Special Issue: Stability & Vibration in Thin-Walled Structures, doi:10.1016/S0020-7462(01)00104-4

Eduard Riks and Charles C. Rankin, “Tools for the evaluation of the residual strength of cracked pressurized fuselage shells”, presented at the Fifth Joint NASA/FAA/DoD Aging Aircraft Conference, 2001?

E. Riks, C.C. Rankin and F.A. Brogan, “The buckling behavior of a central crack in a plate under tension”, *Engineering Fracture Mechanics*, Vol. 43, No. 4, November 1992, pp. 529-548, doi:10.1016/0013-7944(92)90197-M

E. Riks, “Computational Mechanics at the Faculty of Aerospace Engineering, Delft University of Technology”, Memorandum M-675, October, 1993

E. Riks and C. C. Rankin, “Buckling and Postbuckling Behavior of Cracked Plates in Tension”, in *Buckling of Shell Structures, on Land, in the Sea and in the Air*, J. F. Jullien, ed., Elsevier Applied Science Publishing Co., Inc., New York, 1991 (not allowed to see the section of the book where this paper exists.)

C. C. Rankin, F. A. Brogan and E. Riks, “Some computational tools for the analysis of through cracks in stiffened fuselage shells”, *Computational Mechanics*, Vol. 13, No. 3, 1993, pp. 143-156, doi: 10.1007/BF00370132

E. Riks and C. C. Rankin, “Computer simulation of the buckling behavior of thin shells under quasi static loads”, *Archives of Computational Methods in Engineering*, Vol. 4, No. 4, 1997, pp. 325-351, DOI: 10.1007/BF02737118

Riks E (1987), Bulging cracks in pressurized fuselages: A numerical study, Tech. rep., National Aerospace Laboratory, Amsterdam, Netherlands, report No. NLR–MP–87058–U, NTIS No. PB89–153340.

Riks, E., Brogan, F. A., and Rankin, C. C., “Bulging Cracks in Pressurized Fuselages: A Procedure for Computation,” in *Analytical and Computational Models of Shells*, Noor, A. K., Belytschko, T., and Simo, J. C., eds., The American Society of Mechanical Engineers, ASME-CED, Vol. 3, 1989.

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Rankin C.C. and Riks E., (2000) On the Simulation of Crack Propagation in Pressurized Fuselages, AIAA/ASME/ASH/ASC 41th Structures, Structural Dynamics and Materials Conference, Atlanta, AIAA Paper No. 2000-1594.

Eduard Riks, Charles C. Rankin and Francis A. Brogan, "On the solution of mode jumping phenomena in thin-walled shell structures", Computer Methods in Applied Mechanics and Engineering, Vol. 136, Nos. 1-2, September 1996, pp. 59-92, doi:10.1016/0045-7825(95)00970-1

Bushnell, D., Rankin, C. C., and Riks, E., Optimization of Stiffened Panels in which Mode Jumping is Accounted for, AIAA Paper No. 97-1141, April 1997.

Eduard Riks (SMR Biel, eduard.riks@mac.com), "On the Purpose and Limitations of Buckling Analysis", - cocomat.de (no date or publisher given; most recent reference cited is 2003.)

Eduard Riks, "Buckling and post-buckling analysis of stiffened panels in wing box structures", International Journal of Solids and Structures, Vol. 37, Nos. 46-47, November 2000, pp. 6795-6824, doi:10.1016/S0020-7683(99)00315-7

Eduard Riks (Villa Éole, Manosque, France), "Buckling" in Encyclopedia of Computational Mechanics, edited by Erwin Stein, Rene De Borst, and Thomas J.R. Hughes, 2004, ISBN: 9780470091357, Riks "Buckling" article: Doi: 10.1002/0470091355.ecm027, published online: 15 November, 2004

More Selected Publications (this list was obtained from www.en.scientificcommons.org/e_riks I think some of the dates of the publications are incorrect.):

Riks, E., Rankin, C.C., A note on the computation of the imperfection sensitivity of the collapse load of elastic structures (1994)

Riks, E., Knops, H.A.J., Mode enrichment and the analysis of through cracks in thin walled shells under internal pressure (1993)

Vandepitte, D., Riks, E., Nonlinear analysis of Ariane 5 engine frame (1992)