



Professor Atila Barut

Department of Aerospace and Mechanical Engineering
University of Arizona

Research Expertise:

- Development of analytical and numerical solution techniques to predict the response of composite plates and shells
- The micromechanical behavior of materials with crystal plasticity
- Dynamic response of multi-flexible bodies such as MAV and rotor blades

Education:

- Ph.D. : Mechanical Engineering, University of Arizona, 1998
- M.S. : Engineering Sciences, Middle East Technical University, 1990
- B.S. : Engineering Sciences, Middle East Technical University, 1988

Employment:

- 1998-date : Aerospace and Mechanical Engineering, The University of Arizona: Research Assistant 1992-98; Research Associate 1998-99; Assistant Research Scientist 1999-00; Assistant Research Professor 2000-date
- 1989-1992 : Engineering Sciences, Middle East Technical University, Ankara: Teaching and Research Assistant

Honors and Awards:

- Finalist, Seventh Melosh Medal Competition for Best Student Paper on Finite Element Analysis, Duke University, South Carolina, 1995

Courses Taught:

- AME 564b : Mechanics of Deformable Solids
- AME 461a/561a : Finite Element Method

Professional Societies:

- AIAA : The American Institute of Aeronautics and Astronautics

Selected Publications:

Atili Barut, Erdogan Madenci and Alexander Tessler, “Post-buckling Response of Scarf Repaired Laminates Using a Refined Zigzag Element”, AIAA Paper AIAA 2014-0847, 55th AIAA Structures Meeting, Maryland, January 13-17, 2014

Barut, A.; Madenci, E.; and Nemeth, M. P.: Stress and Buckling Analyses of Laminates with a Cutout Using a {3, 0}-Plate Theory. *Journal of Mechanics of Materials and Structures*, vol. 6, no. 6, 2011, pp. 827-868.

A. Barut and E. Madenci, “A complex potential-variational formulation for thermo-mechanical buckling analysis of flat laminates with an elliptic cutout”, *Composite Structures*, Vol. 92, No. 12, November 2010, pp.2871-2884, doi:10.1016/j.compstruct.2010.04.013

- Das, M., Barut, A., Madenci, E., and Amber, D. R., A Triangular Plate Element for Thermo-Elastic Analysis of Sandwich Panels with a Functionally Graded Core, *Int. J. Numer. Methods Eng.* 68:940-966, 2006.

- Oterkus, E., Barut, A., Madenci, E. and Ambur, D. R., Nonlinear Analysis of a Composite Panel with a Cutout Repaired by a Bonded Tapered Composite Patch, *Int. J. Solids Struct.* 42:5274-5306, 2005.

- Das, M., Barut, A., Madenci, E., and Ambur, D.R., Complete Stress Field in Sandwich Panels with a New Triangular Finite Element of Single-Layer Theory, *Comput. Methods Appl. Mech. Eng.* 194:2969-3005, 2004.

- Barut, A., and Madenci E., Thermo-Mechanical Stress Analysis of Laminates with a Cutout via a Complex Potential-Variational Method, *J. Therm. Stresses* 27:1-31, 2004.

Madenci, E. and Barut, A., “The Influence of Geometric Irregularities on the Linear Buckling of Cylindrical Shells with an Elliptical Cutout,” *Proceedings of the 44th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference*, Norfolk, VA. AIAA Paper No. 2003-1929, 2003.

- Barut, A., Madenci, E., Anderson, T., and Tessler, A., Equivalent Single-Layer Theory for a Complete Stress Field in Sandwich Panels Under Arbitrarily Distributed Loading, *Compos. Struct.* 58:483-495, 2002.

- Barut A., Madenci E., Starnes J., and Tessler A., A New Stiffened Shell Element for Geometrically Nonlinear Analysis of Composite Laminates, *Comput. Struct.* 77:11-40, 2000.

- Barut, A., Madenci, E., Tessler, A., Nonlinear Thermoelastic Analysis of Composite Panels Under Non-Uniform Temperature Distribution, *Int. J. Solids Struct.* 37:3681-3713, 2000.

A. Barut, E. Madenci and A. Tessler, “Nonlinear analysis of laminates through a mindlin-type shear deformable shallow shell element”, *Computer Methods in Applied Mechanics and Engineering*, Vol. 143, Nos. 1-2, April 1997, pp. 155-173, doi:10.1016/S0045-7825(96)01140-1

Barut A, Madenci A, Britt VO, Starnes JH. Buckling of a thin, tension-loaded, composite plate with an inclined crack. *Eng Fract Mech* 1997;58: 233–48

Madenci, E. and Barut, A., “Pre- and Postbuckling Response of Curved, Thin, Composite Panels with Cutouts Under Compression, *International Journal for Numerical Methods in Engineering*, Vol. 37, 1994, pp. 1499-1510

Madenci, E., and Barut, A. (1994). “Thermal postbuckling analysis of cylindrically curved composite laminates with a hole.” *Int. J. Numer. Methods Eng.*, 37, 2073–2091.

Madenci, E. and Barut, A., “A free-formulation-based flat shell element for non-linear analysis of thin composite structures”, *International Journal for Numerical Methods in Engineering*, Vol. 37, No. 22, 1994, pp. 3825–3842. doi: 10.1002/nme.1620372206

Suha Oral and Atila Barut, “A shear-flexible facet shell element for large deflection and instability analysis”, *Computer Methods in Applied Mechanics and Engineering*, Vol. 93, No. 3, December 1991, pp. 415-431, doi:10.1016/0045-7825(91)90251-Z