

Figure 3 Variation of Objective function (eq. 6) w.r.t. 2nd and 3rd ply angles.

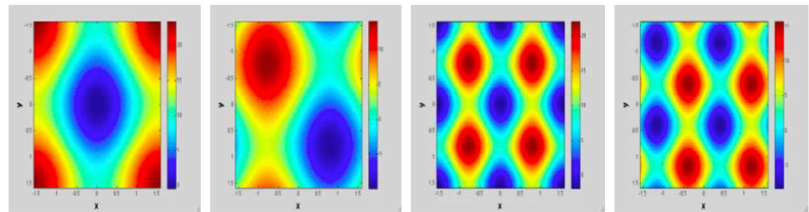


Figure 4 Variation of Constraint functions (eq. 7 a-d) w.r.t. 2<sup>nd</sup> and 3<sup>rd</sup> ply angles

## Professor Erian A. Armanios

From: Aditya P. Apte, Robert A. Haynes, Bo Ping Wang and Erian A. Armanios, “Design of optimal hygrothermally stable laminates with extension-twist coupling by ant colony optimization”, 2nd International Conference on Engineering Optimization, Lisbon, Portugal, September 6-9, 2010

See:

<https://www.uta.edu/academics/schools-colleges/engineering/research/faculty/armanios>

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### Biography:

Professor Armanios works in the areas of structural analysis, design and damage tolerance of advanced composites. Has broad experience in analysis methodology ranging from classical methods to finite element, advanced optimization techniques and nondeterministic models. Current research interests are modeling, stress analysis, testing and failure processes of elastically tailored composites, energy dissipation concepts for composites, use of active materials for flow control and nondeterministic predictive models for aerospace structures diagnostics and failure. Developed and managed collaborative research and educational programs among a consortium of universities, aerospace industry, federal, state and local government to promote, recruit and graduate professionals in science, mathematics and engineering.

### Research Interests:

Design and damage tolerance of advanced composites; Modeling, stress analysis, testing and failure processes of elastically tailored composites; Energy dissipation concepts for composites; Use of active materials for flow control; Nondeterministic predictive models for aerospace structures diagnostics and failure

### Selected Publications:

E. A. Armanios and A. M. Badir, “Hygrothermal influence on mode I edge delamination in composites,” *Compos. Struct.*, vol. 15, no. 4, pp. 323–342, 1990.

Berdichevsky, V., Armanios, E., Badir, A., 1992. Theory of anisotropic thin-walled closed-cross-section beams. *Composites Engineering*, 2(5-7):411-432.

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A. Makeev and E.A. Armanios, An iterative method for solving elasticity problems for composite laminates, *J. Appl. Mech.*, vol. 67, pp. 96-104, 1999.

S. Tawfik, X. Tan, S. Ozbay and E. Armanios, "Modeling of anticlastic stability in elastically tailored composites", in *American Society for Composites—Twentieth Technical Conference-CD-Rom*; edited by DEStech Publications, Incorporated (date of publication not given; most recent reference is 2003, possibly published in 2005)

S. Tawfik, X. Tan, S. Ozbay, E. Armanios, "Anticlastic stability modeling for cross-ply composites", *J Compos Mater*, 41 (11) (2006), pp. 1325-1338

Samer Tawfik, Xinyan Tan, Serkan Ozbay and Erian Armanios (School of Aerospace Engineering, Georgia Institute of Technology Atlanta, GA 30332-0150, USA), "Anticlastic Stability Modeling for Cross-ply Composites", *Journal of Composite Materials*, June 2007, vol. 41, no. 11, pp. 1325-1338

R. Cross, R. Haynes, E. Armanios, "Families of hygrothermally stable asymmetric laminated composites", *J Compos Mater*, 42 (7) (2008), pp. 697-716

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Samer A. Tawfik, D. Stefan Dancila and Erian Armanios, "Unsymmetric composite laminates morphing via piezoelectric actuators", *Composites Part A: Applied Science and Manufacturing*, Vol. 42, No. 7, July 2011, pp. 748-756

Samer A. Tawfik, D. Stefan Dancila and Erian Armanios, "Planform effects upon the bistable response of cross-ply composite shells", *Composites Part A: Applied Science and Manufacturing*, Vol. 42, No. 7, July 2011, pp. 825-833

R.A. Haynes, E.A. Armanios, "The challenge of achieving hygrothermal stability in composite laminates with optimal couplings", *Int J Eng Sci*, 59 (2012), pp. 74-82

Robert Haynes, Julia Cline, Brian Shonkwiler and Erian Armanios, "On plane stress and plane strain in classical lamination theory", *Composites Science and Technology*, Vol. 127, pp 20-27, 2016