Biography

Pascal K. Gotsis

Academic degrees:

1. Doctor of Philosophy (Ph.D)
University of California, Los Angeles, California, USA
Department of Materials Science and Engineering.

2. Master of Science (MSc),
Penn. State University, State College, Pennsylvania, USA,
Deparment of Engineering Mechanics and Science.

3. Diploma
Aristotel's University, Thessaloniki, Greece
Department of Civil Engineering

Research and teaching experience:

1. Technological Educational Institute (TEI) of Central Macedonia Greece.
Professor of the department of Mechanical Engineering (18 years)

2. NASA Glenn Research Center, Cleveland, Ohio, USA
Aerospace engineer (full time permanent employee) (8 years)

3. California State University Long Beach, California, USA
Assistant professor, department of Civil engineering. (2 years)

4. University of California, Los Angeles, USA
Post doctoral research fellow, department of Material Science and Engineering. (2 years)

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Γραμματεύς FAX: 23210-49285

Biography

I was born in Thessaloniki, Greece.

1973 - 1978 Diploma in Civil Engineering, at the Aristotel's university, inThessaloniki, Greece.

1980 - 1982 Master of Science (MSc) at the department in Engineering Mechanics and Science, at The Pennsylvania State University, State College, Pennsylvania, USA.

I have got sholarship. The subject of my Msc was "**Structural Optimization of Thin Shells using the Finite Element Method"**. I have modified the algorithm of the software, DESAP (finite elements and Optimization program in Fortran language). My MSc thesis was published at the International Journal of Computer and Structures.

1983 - 1988 Doctor of philosophy (Ph.D) at the department of **Material Science and Engineering, at The University of California, Los Angeles (UCLA), California, USA**.

I have got sholarship. The subject of my Doctorate was **"Elasto-plastic Analysis of Unidirectional Fiber-Reinforced Composites Subjected to Transverse Normal Loading Using the Finite Element Method".** The computational simulation was obtained using the nonlinear FE program NONSAP and the results were checked using MARK Finite element program. Also a sofware was developed in Fortran language to display the results for pre- and post- processing. Two papers were published at the International Journal of Computer and Structures.

1988 -1990 I was **Post Doctoral research fellow** at the department of **Material Science and Engineering, at The University of California, Los Angeles (UCLA), California, USA**.

1988 - 1990 I was **assistant professor** at the department of **Civil Engineering at California State University, Long Beach, California, USA.**

I have taugth three courses, "Mechanics for engineers, Statics"**,** "Strength of Materials" and"Finite Element method". A research project was funding to me by the head of the structures department Dr. Goodman, of the Aerospace Co. TRW in Redondo Beach, California (now Northrop Grumman). I have developed a software program in Basic computer language with the title: "Mathematical Models for Predicting Curing Deformation of L-Shaped fiber glass composites".

1990 - 1998 I was working as a **full time permanent employee** with the title **Aerospace engineer** at **National Aeronautical and Space Administration (NASA) Glenn (Lewis) Research Center, in Cleveland, Ohio, USA**, at the department of Structural Mechanics, in the Structures and Acoustic Division, of the Research and Development Directorate.

1998 - now, I am **professor** in the deparment of the **Mechanical Engineering**, at the Technological Educational Institude of Central Macedonia (TEI of Central Macedonia), in Serress, Greece.

2005 - 2011, I was head of the Center of Technological Research at TEI of Central Macedonia, in Serres Greece.

The subjects of my research are:

Computational simulation of the mechanical behaviour of the fiber composite materials/structures, crack propagation and prediction of failure, using the Finite element method.
Optimization of structural composite structures.

Teaching experience

1. Mechanics for engineers, Statics.
2.Strength of Materials.
3.Experimental Strength of Materials Lab. Theory of Plasticity in metal structures
4. Finite element theory
5.Computational Simulation using ANSYS (and Workbench).
6.Computational Simulation using GENOA (Advanced Fiber composite FE analysis software).
7. Advance materials. Mechanics of fiber composites (graduate course toward a MSc "Renewable Energy Systems: Design Development & Optimization" in the Mechanical engineering dept., in the department of Mechanical engineering, at TEI of Central Macedonia in Serress Greece.
8. Computational mechanics using ANSYS software composites (graduate course toward a MSc "Renewable Energy Systems: Design Development & Optimization" in the Mechanical engineering dept. at TEI of Central Macedonia, in Serres, Greece.

Organized International school in Advanced composites

In the Summer of the 2012, I have organizer the "**2012 SUMMER SCHOOL IN ADVANCED COMPOSITE MATERIALS"**
International Institute for Multifunctional Materials for Energy Conversion (IIMEC) in conjuction with Texas A & M university, the head prof. Lagoudas Dimitris of the Aerospace engineering department, as well as the National and Science Foundation (NSF of USA). Some of the courses that were taught are the following:
Mechancis of Composites of advenced fiber composites,
Damage Mechanics of Composite Materials,
Fatigue of Composite Materials,
Computational simulation to predict the crack progration and failure load at the advanced fiber composite stuctures using GENOA FE computer software.

Applied and industrial experience at NASA Glenn (Lewis) Research Center, Cleveland, Ohio, USA

For 8 years I have worked full time as a permanent employee Aerospace engineer, at NASA Glenn (Lewis). The subjects of my research were to develope computer softwares on advanced composite mechancis materials and structures and also to perform computational simulations.
Also I was responsible with various research projects, which NASA Glenn (Lewis) provided to universities as well as private Aerospace companies. Some of them are: Clarkson University, of New York, USA, department of Civil engineer, prof. Levon Minnetyan, the General Electric co., Cincinati, Ohio, USA, Alpha Star co. , Long Beach, Ca. USA and Allied Signal, White Sands, New Mexico, USA.

Publications

1. Doctor of Philosophy (Ph.D), Materials Science and Engineering department, University of California, Los Angeles, California, USA, 1989. Ph.d title: "Elasto-plastic Analysis of Unidirectional Fiber-Reinforced Composites Subjected to Transverse Normal Loading Using the Nonlinear Finite Element Method"

2. Master of Science, Engineering Mechanics and Science Department, The Pennsylvania State University, University Park, State College, Pennsylvania, USA, 1982. Master Thesis title: "Optimization of Thin Shell Structures by the Finite Element Method"

3. Diploma of Civil Engineer, Aristotel's university, Thessaloniki, Greece, 1978
Diploma title: "Research on the Organization of Production and Distribution and Calculation of Cost of delivery of Concrete in Greece".

Academic literature-book

"Finite Elements " by Pascal K. Gotsis, Book, editor Ziti, Thessaloniki, Greece, 2013, 3rd edition, 560 pages, and 75 examples with solutions. In Greek language.

INTERNATIONAL JOURNALS

J1. "Elasto-plastic Analysis of an Aluminum Alloy Matrix Reinforced with Silicon Carbide Fibers Packed in a Hexagonal Alloy"
P.K. Gotsis, A.H. Shabaik and G.H. Sines
International Journal of Computers & Structures, 1992, Vol. 41, No.2, pp. 345-353.

J2. "Elasto-plastic Analysis of an Aluminum Alloy Matrix Reinforced with Silicon Carbide Fibers"
P.K. Gotsis, A.H. Shabaik and G.H. Sines
International Journal of Computers & Structures. Technical Note, 1992, Vol. 43, No. 4, pp. 795-802.

***J3. "Combined Bending and Thermal Fatique of High Temperatures MMC: Computational Simulation"**
P.K. Gotsis and C.C. Chamis
16th Thermomechanical Fatigue (TMF) Workshop, at NASA Lewis Research Center, on June 1991. Full paper presented and published.
International Journal of Damage Mechanics, 1992, Vol. 1, No. 3, pp. 290-319.

J4. "Microfracture in High Temperature Metal Matrix Laminates"
S.K. Mital, C.C. Chamis and P.K. Gotsis.
Composite Science and Technology Journal, vol. 50, pp. 59-70, 1994.

J5. "Fiber Composite Thin Shell Subjected to Thermal Buckling Loads"
P.K. Gotsis and J.D. Guptill
International Journal of Computers and Structures, 1994, Vol. 53, No. 6, pp. 1263-1274.

J6."Structural Optimization of Shell Structures"
P.K. Gotsis
International Journal of Computers and Structures, 1994, Vol. 53, No. 4, pp. 1263-1274.

J7."Free Vibration of Fiber Composite Thin Shells in a Hot Enivironment"
P.K. Gotsis and J.D. Guptill
Journal of Reinforced Plastic and Composites, 1995, Vol. 14, pp. 143-163.

J8."Progressive Fracture of Fiber Composite Build-up Structures"
P.K. Gotsis, C.C. Chamis and L. Minnetyan
Journal of Reinforced Plastics and Composites, vol. 16, No. 2, pp.183-198, 1997.

***J9.“Prediction of Composite Laminate Fracture: Micromechanics and Progressive Fracture”**
P.K. Gotsis, C.C. Chamis and L. Minnetyan
Composite Science and Technology Journal 58/7, 1998, p.1137-1149

J10. “Progressive Fracture of Fiber Composite Thin Shell Structures Under Internal Pressure and Axial Loads”
P.K. Gotsis, C.C. Chamis and L. Minnetyan
International Journal of Damage Mechanics, vol.7, pp.332-350, October 1998

***J11. “Progressive Fracture of Blade Containment Composite Structures”**
P.K. Gotsis, C.C. Chamis and L. Minnetyan
Journal of Reinforced Plastics and Composites, vol. 16, No. 15, pp. 1407-1424, 1997.

J12. “Computational Simulation of the Damage of Composite Thin Shell Structures Subjected to Mechanical Loads”
P.K. Gotsis, C.C. Chamis and L. Minnetyan
Journal of Theoretical and Applied Fracture Mechanics, 25(1996) 211-224.

***J13. “Progressive Fracture and Damage Tolerance of Composite Pressure Vessels”**
C.C. Chamis, P.K. Gotsis and L. Minnetyan
Journal of Advanced Materials, vol. 30, no. 1, pp.22-26, Jan. 1998.

J14 “Progressive Damage and Fracture of Stiffened and Unstiffened Composite Pressure Vessels”
L. Minnetyan, P.K. Gotsis and C.C. Chamis
Journal of Reinforced Plastics and Composites, vol. 16, No. 18, pp. 1711-1724, 1997.

***J15. “Laminate Analogy for Composite Enhanced Concrete Structures”**
C. Chamis and P. K. Gotsis
Proceedings of the First Hellenic Conference on Composite Materials and Structures, Xanthi, Greece, July 2-5, 1997, vol.II, pp. 31-50. Invited paper for keynote presentation.
Journal of Advanced Materials, vol. 29, No. 1, pp. 3-10, October 1997.

J16 "Damage Progression in Bolted Composites".
L. Minnetyan, C. C. Chamis and P. K. Gotsis.
Journal of Thermoplastic Composite Materials, vol. II, pp.231-248, 1998.

***J17 “Infrastructure Retrofit Design Via Composite Mechanics”**
C. Chamis and P. K. Gotsis.
Journal of Advanced Materials, Vol.31, No. 4, October 1999, pp.33-36.

J18 “ Meso-Mechanics and Meso-Structures: A Matter of Scale”
C. Chamis, P. K. Gotsis and S. K. Mital.
Journal of Thermoplastic Composite Materials, vol. 11, No. 5, pp.478-490., Sept. 1998.

****J19 “Telescoping Composite Mechanics for Composite Behavior Simulation”.**
C. Chamis, P. L. N. Murthy, P. K. Gotsis and S. K. Mital.
Invited article for a special issue of the Computer Methods in Applied Mechanics and Engineering Journal, 185, pp.399-411, 2000.

*****J20“Application of progressive fracture analysis for predicting failure envelopes and stress-strain behaviors of composite laminates: a comparison with experimental results”,**
P. K. Gotsis, C. C. Chamis, L. Minnetyan, Composites Science and Technology 62 (2002) 1545-1559.

J21. “Application of Composite Mechanics to Composite Enhanced Concrete Structures”,
C.C. Chamis and P. K. Gotsis,
International Journal of Advances in Mechanics and Applications of industrial Materials (IJAMAIM) (ISSN 1718-5505). (Advanced Engineering Solutions Technical Reviews), 2007, Vol. 1, Issue 1, pp.41-54.

J22. “Progressive Fracture of $[0/90/\pm\theta]_S$ Composite Structure Under Uniform Pressure”, P.K. Gotsis, C.C. Chamis, C.K. Gotsis and E. Mouratidis. *International Conference on* International Journal of Advances in Mechanics and Applications of industrial Materials (IJAMAIM). (Advanced Engineering Solutions Technical Reviews) (ISSN 1718-5505), 1(1) 2008, pp. 77-83.

J23. "Impact fatigue failure modes of HVOF coatings", C. David, K.G. Anthymidis, M. Athanasiou and P.K. Gotsis, Journal of ASTM International (JAI) , vol.5, No.6, 2008.
J24. "**Progressive Fracture of Laminated Composite Stiffened Plate**", P.K. Gotsis, C.C. Chamis, K. David and F. Abdi. Journal of Theoretical and Applied Fracture Mechanics, vol.51 (2009) 144–147
J25. "Boronizing of Metallic Materials. A Review",
S. A. Tsipas, D. N. Tsipas, C. N. David and P. K. Gotsis
Journal of Materials Science and Technology , Vol. 23, No. 2, pp. 160–184, (2015)

* At International conference was presented the whole research.

**** Invited article for a special issue of the Computer Methods in Applied Mechanics and Engineering Journal,

***The publications J9 and J20, have been attained under a World - Wide Failure Exercise of advanced fiber composites.
The British professors M. J. Hinton,.A.S. Kaddour and .P. D. Soden invited the creators of the 12 best mathematical models to predict failure on laminate fiber composite materials. The objective was Worl wide Failure exercise and the computational results will be compared with experimental data.
The research team from, NASA Glenn with the chief Dr. Chris C. Chamis and Dr. Pascal K. Gotsis were invited to participate to the competition.
For more information regarding the results of the above world wide exercise there is a book: Failure Criteria in Fibre Reinforced Polymer Composites: The World - Wide Failure Exercise. Book Edited by M. J. Hinton, A.S. Kaddour and P.D.Soden, Elsevier, 2004

NASA publications

NASA1. "Microfracture in High Temperature Metal Matrix Laminates"
S.K. Mital, C.C. Chamis and P.K. Gotsis NASA TM 105189, April 1991.

NASA2. "Metal Matrix Composite Analyzer (METCAN), User's Manual"
H.J. Lee, P.K. Gotsis, P.L.N. Murthy and D.A. Hopkins
NASA TM 105244, 1992, pages 148.

NASA3. "High Temperature Composite Analyzer (HITCAN), Theoretical Manual"
J. Lackney, P.L.N. Murthy and P.K. Gotsis NASA TM 106001, 1992, pages 58.

NASA4 "High Temperature Composite Analyzer (HITCAN), Programmer's Manual"
J. Lackney, P.L.N. Murthy and P.K. Gotsis NASA TM 106004, 1992, pages 132.

NASA5."High Temperature Composite Analyzer (HITCAN), User's Manual"
J. Lackney, S.N. Singal, P.L.N. Murthy and P.K. Gotsis
NASA TM 106002, 1992, pages 180.

NASA6. "Structural Optimization of Shell Structures"
P.K. Gotsis NASA TM 105903, 1992.

NASA7 "Buckling Analysis of Laminated Thin Shells in a Hot Environment"
P.K. Gotsis and J.D. Guptill NASA TM 106302, 1993.

NASA8."Laminated Thin Shell Structures Subjected to Free Vibration in a Hygrothermal Environment"

P.K. Gotsis and J.D. Guptill NASA TM 106600, 1994.

NASA9."Progressive Fracture of Fiber Composite Build-up Structures"
P.K. Gotsis, C.C. Chamis and L. Minnetyan NASA TM 107231, 1996.

NASA10. "Prediction of Composite Laminate Fracture: Micromechanics and Progressive Fracture"
P.K. Gotsis, C.C. Chamis and L. Minnetyan NASA TM 107331, 1996.

NASA11. "Progressive Fracture of Fiber Composite Thin Shell Structures Under Internal Pressure and Axial Loads"
P.K. Gotsis, C.C. Chamis and L. Minnetyan NASA TM 107234, 1996.

NASA12. "Telescoping Mechanics: A New Paradigm for Composite Behavior simulation".
C. Chamis, P. L. N. Murthy, P. K. Gotsis and S. K. Mital. NASA TM-2004-209317

NASA13. "Application of Composite Mechanics to Composite Enhanced Concrete Structures", C.C. Chamis and P. K. Gotsis. NASA TM-2006-214038

NASA14. "Progressive Fracture of Laminated Composite"
Stiffened Plate", P.K. Gotsis, C.C. Chamis, C. David and F. Abdi.
NASA TM—2007-214927

International Conferences

The whole work has been published and presented at the international conference.

CONF1. "Combined Bending and Thermal Fatique of High Temperatures MMC: Computational Simulation", P.K. Gotsis and C.C. Chamis
16th Thermomechanical Fatigue (TMF) Workshop, at NASA Lewis Research Center, on June 1991.

CONF2. "Effect of Combined Loads on the Durability of a Stiffened Adhesively Bonded Composite Structure", P.K. Gotsis, C.C. Chamis and L. Minnetyan
Proceeding of the 36th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference, New Orleans, LA, Part 2, pp. 1083-1092, April 10-13, 1995.

CONF3. "Progressive Fracture in Adhesively Bonded Concentric Cylinders"
L. Minnetyan and P.K. Gotsis
Proceedings of the 40th International SAMPE CONFposium and Exhibition, Anaheim, California, Vol. 40, Book 1, pp. 849-860, May 8-11, 1995.

CONF4. "Computational Simulation of Fiber Composite Thin Shell Structures in a Hygrothermal Environment", P.K. Gotsis
Proceedings of the 5th Europe-Japan Bilateral Colloquium on Composite Material, Corfu, Greece, Sept. 18-22, 1995.

CONF5. "Damage Progression in Bolted Composite Structures"
C.C. Chamis, P.K. Gotsis and L. Minnetyan
Proceedings of the 1995 USAF Structural Integrity Program Conference, 28-30 November 1995, San Antonio, Texas, WL-TR-4094, Vol. II, pp. 663-679, 1996

CONF6. "Progressive Damage and Fracture of Adhesively Bonded Fiber Composite Pipe Joints", C.C. Chamis, P.K. Gotsis and L. Minnetyan

Proceedings of the Conference and Exhibition: CONFposium on Composite Materials Design and Analysis, Houston, Texas, January 29-February 2, 1996. Book V, pp. 401-408, 1996. Sponsored by ASME.

CONF7. "Damage Tolerance of Composite Pressurized Shells"
C.C. Chamis, P.K. Gotsis and L. Minnetyan
Proceedings of the 37th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference, Salt Lake City, Utah, April 15-17, 1996, Part 4, pp. 2112-2121.

CONF8. "Defect Tolerance of Pressurized Fiber Composite Shell Structures"
P.K. Gotsis, C.C. Chamis and L. Minnetyan
Proceedings of the 41st International SAMPE CONFposium and Exhibition, Anaheim, California, March 25-28, 1996, Vol. 41, pp. 450-461.

CONF9. "Progressive Fracture of Composite Subjected to Iosepescu Shear Test"
L.Minnetyan, D. Huang, C.C. Chamis and P.K. Gotsis
Proceedings of the ASTM 13th CONFposium on Composite Materials: Testing and Design, Orlando, Florida, *May 20-21, 1996.*

CONF10."Infrastructure for Coupled Multidisciplinary Problems in Engine Structures"
C.C. Chamis and P.K. Gotsis
Conference Proceedings at the AIAA/NASA/USAF Multidisciplinary Analysis & Optimization CONFposium, Sept. 4-6, 1996, Bellevue, Washington. AIAA-96-4147-CP, Part 2, pp. 1409-1418.

CONF11."Code Certification Process for Multidisciplinary Analysis/Design Optimization", R.L. Mcknight, M.S. Hartle, F.E. Sagendorph, P.K. Gotsis and C.C. Chamis
Conference Proceedings at the AIAA/NASA/USAF Multidisciplinary Analysis & Optimization CONFposium, Sept. 4 - 6, 1996, Bellevue, Washington. AIAA-96-4031-CP, Part 1, pp. 448-458.

CONF12. "Structural Integrity of Composite Containment Structures"
C.C. Chamis, P.K. Gotsis and L. Minnetyan
Conference Proceedings of the 1996 USAF Structural Integrity Program Conference, Dec. 3-5, 1996, San Antonio, Texas.

CONF13. "Laminate Analogy for Composites Application to Infrastructures"
P.K. Gotsis and C.C. Chamis
Conference Proceedings at the 42nd International SAMPE CONFposium and Exhibition, Anaheim, California, May 5-8, 1997, pp. 947-956.

CONF14. "Progressive Fracture of Blade Containment Composite Structures"
P.K. Gotsis, C.C. Chamis and L. Minnetyan
Proceedings of the 11th DOP/NASA/FAA Conference on Fibrous Composites in Structural Design, Fort Worth, Texas, August 26-29, 1996.

CONF15. "Progressive Fracture and Damage Tolerance of Composite Pressure Vessels"
C.C. Chamis, P.K. Gotsis and L. Minnetyan
Conference Proceedings at the International Composites EXPO '97 in Nashville, Tennessee, Jan. 27-29, 1997, session 5-C/1 to 8.

CONF16. "Laminate Analogy for Composite Enhanced Concrete Structures"
C. Chamis and P. K. Gotsis
Proceedings of the First Hellenic Conference on Composite Materials and Structures, Xanthi, Greece, July 2-5, 1997, vol.II, pp. 31-50.

CONF17. "Infrastructure Retrofit Design Via Composite Mechanics"
C. Chamis and P. K. Gotsis.
Conference Proceedings of the International Composites, EXPO '98 - ICE '98, in Nashville, Tennessee, January 19-21, 1998.

CONF18. "Computational Simulation of Concrete Structures Enhanced with Fiber Composites"
P. K. Gotsis and C. C. Chamis
Invited paper for the CONFposium on Materials, Design and Analysis. Energy Resource and Technology Conference, Houston, Texas, February 2-4, 1998.

CONF19."Evaluation of Progressive Fracture in Woven and Non-woven Composites Panels" L. Minnetyan, R. A. Lund, C. C. Chamis and P. K. Gotsis.
Proceedings at the 1997 USAF Aircraft Structural Integrity Program Conference, San Antonio, Texas, December 2- 4, 1997..

CONF20. "Probabilistic Assessment of Fracture in Composite Pressure Vessels"
C. Chamis, P. K. Gotsis and L. Minnetyan.
Conference Proceedings for the 1998 ASME/JSME Pressure Vessels and Piping Conference, San Diego, California, July 26-30, 1998..

CONF21. "Simulation of Ball End Tools Milling"
N. Vidakis, A. Antoniadis, C. Savakis and P. K. Gotsis.
The 16th Conference on Production Research ICPR-16, on 29 July –3 August 2001, Praha, Czech Republic.

CONF22. "Progressive Fracture of $[0/90/\pm\theta]_S$ Composite Structure Under Uniform Pressure", P.K. Gotsis, C.C. Chamis, C.K. Gotsis and E. Mouratidis.
International Conference on Advances and Trends of engineering Materials and their Applications (ATEMA2007), Montreal, Canada, August 6-10, 2007.

CONF23. "Progressive Fracture of Laminated Fiber-Reinforced Composite Stiffened Plate Under Pressure", P.K. Gotsis, C.C. Chamis, F. Abdi and K. Tsouros.
COMP-07: 6th International Symposium on Advanced Composite Technologies. Corfu, Greece, 16-18 May 2007.

CONF24. "Damage Progression of $(0/90/\pm 45)_S$ Laminated Fiber-Reinforced Composite Stiffened Plate Under Mechanical Loads", P.K. Gotsis, C.C. Chamis, K. Tsouros and K. David
8th HSTAM International Congress on Mechanics, Patras, Greece, July 12-14, 2007.

CONF25. "**Impact Fatigue investigation of HVOF coatings",** C.N. David, M. Athanasiou, K. Anthimidis and P.K. Gotsis.
36th ASTM National Symposium on Fatigue and Fracture Mechanics Tampa Marriot Waterside, Tampa, Florida, USA, November 14-16, 2007.

CONF26. "Progressive Fracture of Laminated Fiber-Reinforced Composite Stiffened Plate under Thermomechanical Loads.
P. K. Gotsis, Ch. Chamis, K. David, D. Xie and F. Abdi,
Proceedings of 9th International Conference on Mesomechanics, 13-17 May 2007 France, pp. 509-518.

CONF27. "Damage Progression of Sandwich Plate Due to the Residual Stresses and Thermo-mechanical Loads", P. K. Gotsis.

International Conference MESOMECHANICS 2008, 28 January 2008 to 1 February 2008 Cairo, Egypt

CONF28. "Composite multiscale mechanics for composite enhanced concrete structures", C.C. Chamis, P.K. Gotsis,
7th World Conference on Earthquake Resistant Engineering Stuctures, , VII 395-407, 2009

CONFERENCES

PRES1. "Formal Methods to Design Composite Shells for Robustness and Affordability"
P. K. Gotsis, C. C. Chamis, L. Minnetyan and G. H. Abumeri.
6th National Congress of Mechanics, Thessaloniki, Greece, July 19-21, 2001.
The subject is to obtain a computational simulation of the shell structure made of advanced fiber composite materials to predict the failure load and the type of damages that occured in the materials.NASA 's softwares CODSTRAN and IPAC were used. IPAC uses the probability theory and the design parameters are the mechanical properties of the fibers and of the matrix, and the fiber volume ratio.

PRES2."CSTEM: Coupled Structural, Thermal, Electromagnetic, Acoustic and Tailoring", P.K. Gotsis
First NASA Lewis Multidisciplinary Design Optimization Workshop, (Vol. 1 of 3), Ohio Aerospace Institute, Cleveland, Ohio, Febraury 21, 1995.
The subject is to optimize various parameters such as own weight, cost, natural frequencies and noise of a wind of a turbomachinery. The wind is cosisted of fiber composite laminated materials and is loaded by mechanical, thermal and acoustic loads. The simulation obtained using the FE software CSTEM.

Industrial Report for TRW Aerospace Company in Los Angeles, California, USA, 1990.
"Mathematical Models for Predicting Curing Deformation of L-Shaped Composites"
J. Plecnic, P.K. Gotsis, O.E. Henriquez and A. Pugal
California State Universtity, Long Beach, California, USA
The subject of the research is to develop software in Basic computer language to predict the curing deformation of L-shaped polymer laminated fiber composites subjected to thermal load. TRW aerospace co.(now Northop Grumman) in Redondo Beach, California USA had funded the project, by the head of the structures department Dr. John Goodman.

NASA Glenn Evaluator for funded research projects

Evaluator for NASA funding research projects:

1. Doctoral thesis with the title, "Buckling on shell structures in high temperature", in the Aerospace department, at the University of Virginia, at Chartosville, Virginia, USA. Research proposal MANE-NASA/Lerc/GRP-6633-95.

2. Research and development software "The Mechanics of Woven composite materials", with Alpha Star co. in Long Beach, California, USA. Research proposal 1995 SBIR, **Phase I**, Proposal no: 04.03-8547 NASA Lerc (Glenn), Chron 951890.

3. Research and development software “The Mechanics of Woven composite materials”, with Alpha Star co. in Long Beach, California, USA. Research proposal 1996 SBIR, **Phase II**, no: 95-1 04.03.

Research and development activities in USA

1) When I was assistant professor at California State University, at Long Beach, California, USA, (1988-1990) a research project was funded to me by the head of the structures department Dr. Goodman, of the Aerospace Co. TRW in Redondo Beach, California (now Northrop Grumman). I developed a software program in Basic computer language to predict the deformation of the L-shape polymer fiber glass composites. The results were closed with the experimental results.

2) At NASA Glenn (Lewis) from the research program HITEMP (High Temperature Metal Matrix Composites and Structures) a software was developed with the name **METCAN** (Metal Matrix Composite Analyzer) to predict the mechanical properties and stresses at the fibers, matrix and the interphase of fiber-matrix. The research group consisted of the following: The chief Dr. C. C. Chamis, Dr. P. Murthy, Dr. P. K. Gotsis and Dr. Ho Jun Lee.

3) At NASA Glenn (Lewis) from the research program HITEMP (High Temperature Metal Matrix Composites and Structures) a software was developed with the name **HITCAN.** HITCAN consists of three modules: a) METCAN analyzer, b) COBSTRAN to create the pre-processing (generate the geometry the nodes and the elements) and c) MHOST a finite element solver. The research group consisted of the following: The chief Dr. C. C. Chamis, Dr. P.K. Gotsis et.al.

4) At NASA Glenn (Lewis) from the research program HITEMP (High Temperature Metal Matrix Composites and Structures) provided a fund to simulate the turbo engine of a new type airplane. Stresses, deformation and failure load were computed. The research group consisted of the following: The chief Dr. C. C. Chamis, Dr. P.K. Gotsis, et.al. Experimental results were compared and were closed with the simulation results, performed by the Aerospace co. Pratt & Whitney.

5) The NASA Glenn (Lewis) research program EPM (Enabling Propulsion Materials) provided a fund to simulate a shell-ring type turbo engine made of composite materials subjected to high pressure and temperature. The simulation obtained using CSTEM software. The results were used by the aerospace co. General Electric in Cincinnati, Ohio, USA for the design of the High Speed Vehicle. The research group consisted of the following: The chief Dr. C. C. Chamis, Dr. P.K. Gotsis et. al.

6) From the NASA Glenn (Lewis) the Structures and Acoustics division funded a proposal to improve and advance a complicated software TBEST to simulate structures made of composite materials to compute stresses, deformations and also the cost of different parts of a turbo machine. TBEST consist of the following modules: a) COSMO for pre-processing to create the geometry, the nodes and the elements, b) CSTEM an analyzer and b) BLASIM to simulate the wing of the turbo machine subjected to dynamic load as well as the cost of the structure. The research group consisted of the following: The chief Dr. C. C. Chamis, Dr. P.K. Gotsis et. al.

7) From NASA Glenn (Lewis) the Structures and Acoustics division funded a proposal to improve and advance CODSTRAN software to simulate the damage progression and failure of polymer fiber composite structures. The research group consisted of the following: The

chief Dr. C. C. Chamis, Dr. P.K. Gotsis and prof. L. Minnetyan from Clarkson University, in New York, USA.

8) From NASA Glenn (Lewis) the Structures and Acoustics division funded a proposal to participate in the invitation of the British professors M.J. Hinton,.A.S. Kaddour and P.D. Soden. The British professors invited the creators of the 12 best mathematical models to predict failure on laminate fiber composite materials. The objective was Worl wide Failure exercise and the computational results will be compared with experimental data.
The research team from, NASA Glenn with the chief Dr. Chris C. Chamis and Dr. Pascal K. Gotsis were invited to participate to the competition.
For more information regarding the results of the above world wide exercise there is a book: Failure Criteria in Fibre Reinforced Polymer Composites: The World - Wide Failure Exercise. Book Edited by M. J. Hinton, A.S. Kaddour and P.D.Soden, Elsevier, 2004

9) From NASA Glenn (Lewis) the Structures and Acoustics division funded a proposal to improve the software CSTEM (Coupled Structural, Thermal, Electromagnetic, Acoustic analysis, Optimization). The research team from, NASA Glenn with the chief Dr. Chris C. Chamis and Dr. Pascal K. Gotsis et.al.

RESEARCH AND EDUCATIONAL ACTIVITIES AT TEI OF CENTRAL MACEDONIA, GREECE.

1) Scientific associate in 1999 PENED research project entitled: "General Simulator Model milling - Three-dimensional Surface Roughness".
2) In charge for Reforming the Undergraduate Program in the Mechanical engineering department for the second E.P.E.A.K. for the period from 09-01-2003 until 31-12-2004.
3) Scientific associate to simulate the dynamic behavior of metal treatment using the FE method. Metrotechniki analysis in real time treatment in multi-axis milling using multiple sensors and appropriate simulant model. Archimedes program from 02.01.2004 to 31.12.2005.
4) In charge for reforming the Undergraduate Program in the Mechanical engineering department for the second E.P.E.A.K. for the period from 1-12-2004 until 30-2-2008.

5) Scientific director of the research project“Improving Surface Properties of Titanium Alloy”, funded by ARCHIMEDES III, 2012-2015

REVIEWER INTERNATIONAL JOURNALS

1. S.A. Dunn, “Separation of Strain Components in Composite Materials for Thermoelastic Temperature Measurements”, submitted in Journal of Applied Mechanics, ASME, October 1991.

2. A.V. Srivasan and B.N. Cassenti, “Hierarchy as a Principle in the Design and Development of Structural Components: A Preliminary Study”, submitted in The American Institute of Aeronautics and Astronautics Journal, October 1993.

3. T. Nicolas et al, “Analysis of a $[0/90]_4$ Metal Matrix Composite under Thermomechanical Fatigue Loading”, submitted in Composites Engineering, An International Journal, February 1993.

4. A.K. Noor and W.S. Burton, “Computational Models of Sandwich Panels and Shells”, submitted in The Journal of Applied Mechanics Reviews, May 1995.

5. N. Rastogi and E.R. Johnson, “Analysis of an Internally Pressurized Orthogonally Stiffened Cylindrical Shell with an ACONFmetrical Section Ring”, submitted in Mechanics of Composite Materials and Structures Journal, August 21, 1995.

6. S. Abrate, “Impact on Sandwich Structures with Laminate Facings”, submitted in Mechanics of Composite Materials and Structures Journal, October 19, 1995.

7. D. Zenkert, O. Schubert and M. Burman, “Fracture Initiation in Foam Core Sandwich Due to Singular Stresses at Corners of Flawed Butt-Joints”, submitted in Mechanics of Composite Materials and Structures Journal, September 28, 1995.

8. R. Rikards and A. Chate, “Vibration and Damping Analysis of Laminated Composite and Sandwich Shells”, submitted at Mechanics of Composite Materials and Structures Journal, on May 13, 1996, MCMS 960513.

9. T. Nishiwaki, H. Hamada and Yokoyama, “Unified Numerical Model for Laminated Composites”, submitted at the Proceedings of the 13th CONFposium on Composite Materials: Testing and Design, on May 31, 1996, STP 1242.

10. J. Holnicki-Szulc, “Design of Adaptive Structures for Improved Impact Adsorption”, submitted for publication at the Proceedings of the 6th AIAA/USAF/NDA/ISSO CONFposium on Multidisciplinary Analysis and Optimization CONFposium, Bellevue, WA, Sept. 4-6, 1996.

11. D.C. Lagoudas, S. Xu and X. Ma, “Surface Damage Modeling of Oxidized Metal Matrix Composite Laminate Under Axial and Transverse Tension”, International Journal of Damage Mechanics, Sept. 19, 1996.

12. R. Blab, K. Kappl, E. Aigner, R. Lackner, "A Finite Element approach to predict permanent deformation behavior of Hot Mix Asphalt based on fundamental material tests and advanced rheological models", (Manuscript ID STRAIN-0079), Journal Strain, 29 July 2007. Editor-in-Chief, Strain, Prof. Emmanuel Gdoutos, egdoutos@civil.duth.gr

REVIEWER NASA TECHNICAL JOURNALS

1. Chairman of the Three Members Review Committee for the Evaluation of the Best Paper (NASA Technical Report or Journal) for the year 1990-91.

2. A.R. Shah et al, “Probabilistic Evaluation of Uncertainties and Risks in Aerospace Components”, December 1991.

3. C.C. Chamis et al, “Progressive Fracture of Polymer Matrix Composite Structures”, December 1991.

4. C.C. Chamis et al, “Coupled Multi-Disciplinary Simulation of Composite Engine Structures in Propulsion Environment”, December 1991.

5. S.S. Pai et al, “Probabilistic Analysis of the Space Truss”, October 1991.

6. S.S. Pai et al, “Probabilistic Progressive Buckling of Trusses”, July 1991.

7. M. Morel et al, “Metal Matrix Laminate Tailoring, User’s Manual”, June 1992.

8. S. Singhal et al, “Coupled Multi-Disciplinary Composites Behavior Simulation”, April 1992.

9. S. Mital et al, “Computational Simulation of Matrix Micro-slip Bands in Sic/Til5 Composite”, March 1992.

10. M. Shiao et al, “Methods for Computationally Efficiency and Accurate Structural Reliability”, March 1992.

11. J.D. Guptill et al, “Comparative Evaluation Test Bed of Optimization and Analysis Routines for the Design of Structures, Users Manual, Release 1.0”, June 1993.

12. S.K. Mital et al, Ceramic Matrix Composite Properties/Microstresses with Complete and Interphase Bond”, February 1993.

13. A. Gendy, S. Patnaik, D. Hopkins and L. Berke, “Preliminary Analysis and Design Optimization of Short Spacer Truss of Space Station Freedom”, February 1993.

14. L. Minnetyan and C.C. Chamis, “The C(T) Specimen in Laminated Composite Testing”, April 1995.

15. C.C. Chamis et al, “Probabilistic Simulation of Failure in Bolted Joint Composite Laminates”, March 1995.

16. G.H. Abumeri, C.C. Chamis and E.G. Generazio, “Insertion and Benefits of Processing Technology in Composite Structures”, March 1995.

AWARDS AT NASA GLENN (LEWIS)

1) On September 2000, NASA Glenn . awarded and congratulated me for the quality of the paper entitled “Design Composite Repair and Retrofits for Infrastructures” by P.K. Gotsis and C. C. Chamis, published at NASA Tech Briefs.
2) On July 1998,” the American Institute of Composites” awarded me due to the quality of the paper and the presentation of the research work entitled "Infrastructure Retrofit Design Via Composite Mechanics", at the conference International Composites Expo '98, January 19-21, 1998, Nashville, Tennessee , by P. K. Gotsis

3) In January 1997, ” the American Institute of Composites” awarded me due to the quality of the paper and the presentation of the research work entitled “Progressive Fracture and Damage Tolerance of Composite Pressure Vessels”, at the conference International Composites Expo ’97, January 27-29, 1997, Nashville, Tennessee, by P.K. Gotsis.
4) In November 1995, Professor David Hui (University of New Orleans) president of the International Conference of Composites Engineering, ICCE/3, New Orleans November 1995 sent me a letter and thanked me for the excellent presentation of my research work and I was invited to organize and chair a part (session) in conference International Conference of Composites Engineering, ICCE / 3, July (21-26) 1996.
5) In December 1995, professors G. Simitses (University of Cincinnati) and G.A. Kardomateas (Georgia Tech. University) organizer of the SES' 95: Society of Engineering Science 32nd Annual Technical Meeting, October 29 - November 2, 1995, New Orleans, LA congratulated me for the quality of my presentation at the conference.
6) In October 1994, the president Dr. Ross of the NASA Glenn, awarded me for my research activities at NASA.

7) In September 1994, from NASA Glenn I received an achievement award for the quality of the paper “Simulating Microfracture in Metal Matrix Composites” published at NASA Tech Brief, by P.K. Gotsis.

8) In 1994, Mr Dale Hopkins the director of the structures department at NASA Glenn, had provided to me and my team, an achievement award for the best publication in the department. The title of the paper was “Micro-Fracture in High Temperature Metal Matrix Laminates” by P.K. Gotsis et. al.

10) In 1993, the president of NASA Glenn Dr. Ross thanked me for a charity event that took place in Cleveland, Ohio local community and I had participated.
11) In April 1993, the NASA Lewis (Glenn) president Dr Ross, awarded me and my team due to the excellent results that obtained from the computational simulation of a ring shape shell structure (combustion engine) consisting of composite materials, and loaded with high temperature and pressure .CSTEM program was used to predict the failure load of the engine.

EXPERIENCE WITH COMPUTERS AND SOFTWARES

A. COMPUTERS AND OPERATING SYSTEMS

1) Supercomputers: CRAY XMP και YMP. Operating system: UNIX
2) Workstations: SGI και SUN. Operating system: UNIX
3) Operating systems: LINUX, Windows.
4) FORTRAN language και MATLAB software/

B. SOFTWARE FOR ENGINEERING APPLICATIONS

ICAN	Integrated Composite Analyzer computer code (NASA).
CSTEM	Coupled Structural/Thermal/Electromagnetic Analysis/Tailoring of Graded Composite Structures (NASA)..
CODSTRAN	Computational simulation of the damage progression of fiber composite structures (NASA)..
METCAN	Metal Matrix Composite Analyzer (NASA)..
HITCAN	Structural Metal Matrix Composite Analyzer (NASA)..
MHOST	A nonlinear finite element program (NASA).
SAPIV	A linear finite element program (UCLA).
NONSAP	A nonlinear finite element program (UCLA).
CALSAP	A nonlinear finite element program (UCLA). Los Angeles, California, USA.
DESAPI	A structural optimization program (PENN STATE UNIVERSITY).
MARC	A finite element program with linear and nonlinear capabilities. Palo Alto, California, USA . (UCLA).
ANSYS	A finite element program with linear and nonlinear capabilities. (TEI Central Macedonia, Greece).
ICES-STRUDL	A structural analysis program (PENN STATE UNIVERSITY)..
IMSL	Commercial FORTRAN Mathematical Subroutines (UCLA)..
CALCOMP	Commercial FORTRAN Graphics Subroutines (UCLA)..
CAED	Commercial graphics interactive computer program. Pre- and post-processor program (UCLA)..
PATRAN	Commercial graphics interactive computer program. Pre- and post-processor program (NASA).

TECHNICAL CHAMBER OF GREECE

Association of Civil engineering.

ΓΛΩΣΣΕΣ

Ελληνικά, Αγγλικά.