

Theodore P. Philippidis*

Associate Professor

(Birth date: September 9, 1958 – Birthplace: Athens, Greece
– Marital Status: Married, 2 children)

Education: (1989) Doctorate in Applied Mechanics, The National Technical University of Athens (NTUA) – (1986) Diploma in Mechanical Engineering, NTUA

Academic Positions: (1990-1993) Lecturer, Dept. of Mech. Eng., Uni. Patras, Greece. (1993-1998) Assistant Professor, Dept. of Mech. Eng., Uni. Patras, Greece. (1998-2000) Assistant Professor (Tenure), Dept. of Mech. Eng., Uni. Patras, Greece. (2000-present) Associate Professor, Dept. of Mech. Eng. & Aeronautics, Uni. Patras, Greece.



Research and Academic Activity

Teaching Activities: Statics, Mechanics of Composite Materials, Non Destructive Inspection of materials and structures, Design of Composite Structures, Experimental Mechanics of Composites, Theory of Elasticity (graduate), Mechanics of Laminated Plates (graduate)

Research Interests: Mechanics of composite materials, Anisotropic elasticity, Failure mechanics, Non-Destructive Testing and Evaluation techniques, Wave propagation in multilayer structures, Experimental mechanics, Numerical and analytical methods in structural analysis, Wind Engineering, Design of composite rotor blades and manufacturing technologies, Progressive damage mechanics, life prediction under spectrum loading, probabilistic methods in the design of composite structures, residual strength and fatigue damage characterization of composite materials using wave propagation techniques

Research Advisor/Completed PhD

1. A. A. Anastassopoulos, Non Destructive Characterisation of Damage in Composite Materials by Means of Pattern Recognition Techniques (1995)
2. V. N. Nikolaidis, NDT techniques in composite materials using non-conventional pattern recognition methods (1998)
3. A. P. Vassilopoulos, Determination of fatigue life of fibre reinforced composite materials under plane stress states (2000)
4. D. G. Aggelis, Non Destructive Testing and Composition Characterization of Concrete through analysis of wave propagation parameters (2004)
5. V. A. Passipoularidis, Residual strength & life prediction in composite materials after fatigue (2008)
6. T. T. Assimakopoulou, Damage assessment in laminated composite structures using acoustic methods (2009)
7. A. E. Antoniou, Progressive damage in multi-directional laminates made of composite materials; its effects on guided wave propagation (2009)
8. D. J. Lekou, Reliability estimation in the design of composite material structures (2010)

Professional Affiliations: Technical Chamber of Greece, Greek Association of Mechanical Engineers, Hellenic Society of Composite Materials (founding member), Hellenic Society of Nondestructive Testing (Secretary 1992-1994), Hellenic Society for Wind Energy

Scientific responsible/Research Associate in over 36 international (STRIDE, BRITE-EURAM, JOULE, FP6, AGARD, COMETT), national (EPET-II, PAVE, National Academy

of Athens) and consultancies (Public Power Corporation, CRES, Geobiologiki SA, HELM Hellas)

Publications: 70 refereed journal papers, 4 book chapters, Editor of 2 books, Guest-Editor of NDT&E, 50 papers in national & international conference proceedings

Journal Reviewer:

International Journal of Fracture, *NDT&E International*, Ultrasonics, Journal of Dynamic Systems Measurement and Control (ASME), Advanced Composites Letters, Neural Computing & Applications, Composites Science & Technology, International Journal of Solids & Structures, Journal of Solar Energy Engng (ASME), International Journal of Fatigue, Engineering Structures, Probabilistic Engineering Mechanics, Wind Energy, Polymer Composites

Conferences

- Member of International Scientific Committee at COMP '90, Advanced Composites in Emerging Technologies, Patras 20-24 August 1990.
- Member of Scientific Committee at 1st Joint Belgian-Hellenic Conference on Non Destructive Testing, Patras 22-23 May 1995.
- Member of Scientific Committee of National conference: Applications of Renewable Energy Sources, Athens, Eugenides Foundation, 30.11 to 02.12.1998.
- (Co)-Organizer of 2nd International Conference: Emerging Technologies in Non Destructive Testing, Athens 24-26 May 1999.
- Member of Scientific Committee of 3rd International Conference: Emerging Technologies in Non Destructive Testing, Thessalonica 26-28 May 2003
- Member of Scientific Committee of EWEA's Special Topic Conference: The Science of making torque from the wind, Delft University of Technology 19-21 April 2004
- Member of the International Advisory Committee of the 27th RISOE International Symposium on Materials Science "Polymer Composite Materials for Wind Power Turbines", RISOE Roskilde 4-7 September 2006
- Member of Conference Organizing Committee of 4th International Conference: Emerging Technologies in Non Destructive Testing (ETNDT4), Stuttgart 2-4 April 2007
- Member of Scientific Committee of EAWE 3rd Conference: The Science of making torque from the wind, FORTH Heraklion Crete 28-30 June 2010

Books

- Advanced Composites in Emerging Technologies, Eds. S. A. Paipetis, T. P. Philippidis, AMATEC Publications, 1991.
- Emerging Technologies in Non Destructive Testing, Eds. D. Van Hemelrijck, A. A. Anastassopoulos, T. P. Philippidis, A. A. BALKEMA Publishers, Rotterdam 1999.

Book Chapters

1. *Fatigue of Glass-Fiber-Reinforced Plastics Under Complex Stress States*, T. P. Philippidis & A. P. Vassilopoulos, in ***Handbook of Advanced Materials***, Ed. J. K. Wessel, Ch.1 pp.16-63, John Wiley & sons (2004)
2. *Fatigue strength of composites under variable plane stress*, T. P. Phillipidis & A. P. Vassilopoulos, in ***Fatigue in Composites***, Ed. B. Harris, Ch.18 pp.504-525, WoodHead Publishing Ltd. (2004)
3. *A progressive damage mechanics algorithm for life prediction of composite materials under cyclic complex stress*, T. P. Phillipidis & E. N. Eliopoulos, in ***Fatigue Life Prediction of Composites and Composite Structures***, Ed. A. P. Vassilopoulos, Ch.11 pp. 390-436, WoodHead Publishing Ltd. (2010)
4. *Health monitoring of composite structures based on acoustic emission measurements*, T.

T. Assimakopoulou & T. P. Philippidis, in *Fatigue Life Prediction of Composites and Composite Structures*, Ed. A. P. Vassilopoulos, Ch.13 pp. 466-504, WoodHead Publishing Ltd. (2010)

Recent research Projects (Scientific responsible for UP unless otherwise stated)

- Development of Greek Wind Turbine Technology in the range of 400-500 kW and simultaneous development of rotor blade technology, EPET#573 (1995-2000)
- Development of a numerical simulation tool for optimal structural design of a prototype wind turbine rotor blade, GEOBIOLOGICH S.A. (1999)
- European Wind Turbine Testing Procedures & development. Task 2: Blade Test Methods and Techniques (SMT/CRES) (1998-1999)
- Non- Destructive Material Testing and Composition Control (MHKKYNES), EPET#M7 (1998-2001) (researcher)
- Adaptation of existing wind turbines for operation on high wind speed complex terrain sites; kWh cost reduction (ADAPTURB) (1999-2002) JOR3-CT98-0251.
- Probability Distribution of Fatigue Strength of Rotor Blades (PROFAR) (1999-2001) JOR3-CT98-02 (researcher)
- Acoustic Emission Proof Testing and Damage Assessment of Wind Turbine Blades (AEGIS) (1999-2002) JOR3-CT98-0283.
- Development of a MW scale wind turbine for high wind complex terrain sites (MEGAWIND) (2001-2004) ENK5-CT2000-00328
- Wind Turbine rotor blades for enhanced aeroelastic stability and fatigue life using passively damped composites (DAMPBLADE) (2001-2004) ENK6-CT2000-00320 (researcher)
- Reliable Optimal Use of Materials for Wind Turbine Rotor Blades (OPTIMAT BLADES) (2002-2006) ENK6-CT2001-00552
- Integrated Wind Turbine Design (UPWIND) (2006-2011) EU Contract #019945
- Composites repair methods in wind turbine rotor blades, COMPBLADES S.A. (2009-2012)

Membership in Academic Organizations

European Academy of Wind Energy (EAWE), Country Node member (www.eawe.org)

Recent Publications

1. *Failure prediction for a Glass/Epoxy Cruciform Specimen under Static Biaxial Loading*, A. E. Antoniou, D. Van Hemelrijck, T. P. Philippidis, *Compos. Sci. Tech.*, **70** (2010) 1232-1241
2. *Mechanical behavior of glass/epoxy tubes under combined static loading. Part I: Experimental*, A. E. Antoniou, C. Kensche, T. P. Philippidis, *Compos. Sci. Tech.*, **69** (2009) 2241-2247
3. *Mechanical behavior of glass/epoxy tubes under combined static loading. Part II: Validation of FEA progressive damage model*, A. E. Antoniou, C. Kensche, T. P. Philippidis, *Compos. Sci. Tech.*, **69** (2009) 2248-2255
4. *A study of factors affecting life prediction of composites under spectrum loading*, V. A. Passipoularidis, T. P. Philippidis, *Int J Fatigue*, **31** (2009) 408-417
5. *Strength degradation due to fatigue-induced matrix cracking in FRP composites: An acoustic emission predictive model*, T. P. Philippidis, T. T. Assimakopoulou, *Compos. Sci. Tech.*, **68** (2008) 3272-3277
6. *Using acoustic emission to assess shear strength degradation in FRP composites due to constant and variable amplitude fatigue loading*, T. P. Philippidis, T. T. Assimakopoulou, *Compos. Sci. Tech.*, **68** (2008) 840-847
7. *Residual strength after fatigue in composites: Theory vs. experiment*, T. P. Philippidis, V. A. Passipoularidis, *Int J Fatigue*, **29** (2007) 2104-2116

8. *Wave dispersion and attenuation in fresh mortar: theoretical predictions vs. experimental results*, D. G. Aggelis, D. Polyzos, T. P. Philippidis, *J Mech. Phys. Solids* **53** (2005) 857-883
9. *An acousto-ultrasonic approach for the determination of water-to-cement ratio in concrete*, T. P. Philippidis, D. Aggelis, *Cement & Concrete Res.* **33** (2003) 525-538
10. *Complex stress state effect on fatigue life of GRP laminates. Part II, Theoretical formulation*, T. P. Philippidis, A. P. Vassilopoulos, *Int. J. Fatigue*, **24** (2002) 825-830
11. *Fatigue design allowables for GRP laminates based on stiffness degradation measurements*, T. P. Philippidis, A. P. Vassilopoulos, *Compos. Sci. Tech.*, **60** (2000) 2819-2828
12. *Assessment of strain gauge measuring efficiency in performing wind turbine blade load measurements*, K. Papadopoulos, E. Morfiadakis, T. P. Philippidis, D. J. Lekou, *Wind Energy* **3** (2000) 35-65