



2D Aerodynamic Airfoils

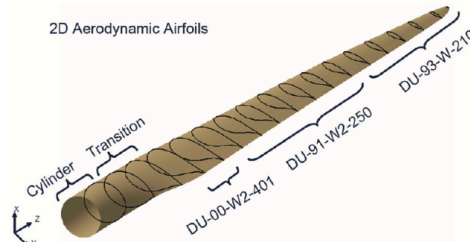


Figure 1 : Different Airfoils along the blade.

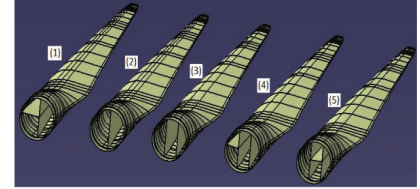


Figure 4 : Blades with different spar-web.

Professor Mostapha Tarfaoui

From: M. Tarfaoui, J.Y. Pradillon and O.R. Shah, “Numerical investigation of a large composite wind turbine [blade] with different spar profiles using finite-element method”, La Houille Blanche, No. 5, pp 29-35, 2015, DOI 10.1051/lhb/20150052

See:

- https://www.researchgate.net/profile/Mostapha_Tarfaoui
- <https://scholar.google.fr/citations?user=di181JIAAAAJ&hl=fr>
- <http://ensta-bretagne.academia.edu/MostaphaTarfaoui>
- <https://www.intechopen.com/profiles/16937/mostapha-tarfaoui>
- <https://www.thinkable.org/users/mostapha-tarfaoui>

Mechanics and Materials

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Research Interests (from <https://www.thinkable.org/users/mostapha-tarfaoui>):

Naval and Offshore structures - composite materials - mechanical behaviour - static and dynamic response - finite element analysis - residual strength - damage modelling - fracture behaviour - interlaminar fracture toughness - correlation of structure & properties, computer modelling and data bases - Renewable Marine Energies.

Autobiography (from <https://www.intechopen.com/profiles/16937/mostapha-tarfaoui>):

My research activities articulate around the development of experimental, theoretical and numerical approaches for a better description of the elastic behaviour of damaged composite material under dynamic loading in terms of dynamic response and damage kinetic. The hot line of this work is the comprehension of the appearance and the evolution of damage. This comprehension aims to better describing, simulating and optimizing the macroscopic behaviour of composite materials by multi scales approaches and by integrating certain aspects of their microstructure. For this objective, my research tasks are undertaken by developing two complementary approaches jointly: the experimental investigation and multi scales modelling of the mechanical behaviour. These two approaches were enriched by a third orientation. This one relates to the numerical developments of algorithms aiming at implementing the behaviour laws in structures computer codes by using finite elements method. These laws are developed for the modelling of the dynamic response, the produced damage and residual strength and/or are identified directly through experimental and numerical procedures.

Selected Publications:

P. Gning, M. Tarfaoui, F. Collombet, L. Riou and P. Davies , Damage development in thick composite tubes under impact loading and influence on implosion pressure: Experimental observations, Compos. B, Eng. 36 (4) (2005) 306–318.

M. Tarfaoui, P.B. Gning, P. Davies and F. Collombet, "Scale and size effects on dynamic response and damage of glass/epoxy tubular structures", *Journal of Composite Materials*, Vol. 41, No. 5, pp 547-558, March 2007

Mostapha Tarfaoui, Papa Birame Gning and Francis Collombet, "Damage modeling of impacted tubular structures by using material property degradation approach", Chapter in unidentified book, 2009, DOI: 10.1007/978-90-481-2669-9_24

M. Tarfaoui, S. Choukri and A. Neme, "Dynamic response of symmetric and asymmetric E-glass/epoxy laminates at high strain rates", *Key Engineering Materials*, Vol. 446, pp 73-82, 2010

G. Mohamad, M. Tarfaoui and V. Bertram, "FEA of dynamic behavior of top hat bonded stiffened composite panel", *Key Engineering Materials*, Vol. 446, pp 137-145, 2010

M. Tarfaoui, J.Y. Pradillon and O.R. Shah, "Numerical investigation of a large composite wind turbine [blade] with different spar profiles using finite-element method", *La Houille Blanche*, No. 5, pp 29-35, 2015, DOI 10.1051/lhb/20150052

M. Tarfaoui, K. Lafdi, A. El Moumen, Mechanical properties of carbon nanotubes based polymer composites, *Compos. B Eng.*, 103 (2016), pp. 113-121

Omar H. Hassoon and Mostapha Tarfaoui, "Damages modeling in composite materials: Effect of laminate stacking sequences", ICILSM 2016, 22-26 May 2016, Turin, Italy

M. Nachtane, M. Tarfaoui, D. Saifaoui and K. Hilmi, "Hydrothermal and mechanical performance evaluation of glass-polyester composite for renewable marine energies, 13th Congress of Mechanics, 11-14 April 2017, Meknes, Morocco

H. Benyahia, M. Tarfaoui, V. Datsyuk, A. El Moumen, S. Trotsenko and S. Reich, "Dynamic properties of hybrid composite structures based multiwalled carbon nanotubes", *Composites Science and Technology*, Vol. 148, pp 70-79, August 2017

O.H. Hassoon, M. Tarfaoui, A. El Malki Alaoui and A. El Moumen, "Experimental and numerical investigation on the dynamic response of sandwich composite panels under hydrodynamic slamming loads", *Composite Structures*, Vol. 178, pp 297-307, October 2017

O.H. Hassoon, M. Tarfaoui and A. El Malki Alaoui, "An experimental investigation on dynamic response of composite panels subjected to hydroelastic impact loading at constant velocities", *Engineering Structures*, Vol. 153, pp 180-190, December 2017

Mourad Nachtane, Mostapha Tarfaoui, Dennoun Saifajoui and Ahmed El Moumen, "Finite element analysis of composite wind turbine blade under the critical loads", Eleventh International Conference on Thermal Engineering: Theory and Applications, February 25-28, 2018, Doha, Qatar

M. Tarfaoui and A. El Moumen, "Dynamic behavior of top-hat bonded stiffened composite panels: Experimental characterization", *Composites Part B: Engineering*, Vol. 149, pp 216-226, 15 September 2018

O.H. Hassoon, M. Tarfaoui, A. El Malki Alaoui and A. El Moumen, "Mechanical behavior of composite structures subjected to constant slamming impact velocity: An experimental and numerical investigation", *International Journal of Mechanical Sciences*, Vol. 144, pp 618-627, 2018

Mostapha Tarfaoui, Khalid Lafi, Imane Beloufa, Debora Daloia and Ali Muhsan, "Effect of graphene nano-additives on the local mechanical behavior of derived polymer nanocomposites", *Polymers*, Vol. 10, 667, 2018

Mostapha Tarfaoui and Mourad Nachtane, "Stacking lay-up effect on dynamic compression behaviour of E-glass/epoxy composite materials: Experimental and numerical investigation", *Advanced Materials Letters*, Vol. 9, No. 11, pp 816-822, 2018

A. El Moumen, M. Tarfaoui, H. Benyahia and K. Lafdi, "Mechanical behavior of carbon nanotubes-based polymer composites under impact tests", *Journal of Composite Materials*, Vol. 53, No. 7, pp 925-940, March 2019

A. El Moumen, M. Tarfaoui, M. Nachtane and K. Lafdi, "Carbon nanotubes as a player to improve mechanical shock wave absorption", *Composites Part B: Engineering*, Vol. 164, pp 67-71, 1 May 2019

O.H. Hassoon, M. Tarfaoui, A. El Moumen, Y. Qureshi, H. Benyahia and M. Nachtane, "Mechanical performance evaluation of sandwich panels exposed to slamming impacts: Comparison between experimental and SPH results", *Composite Structures*, Vol. 220, pp 776-783, 15 July 2019