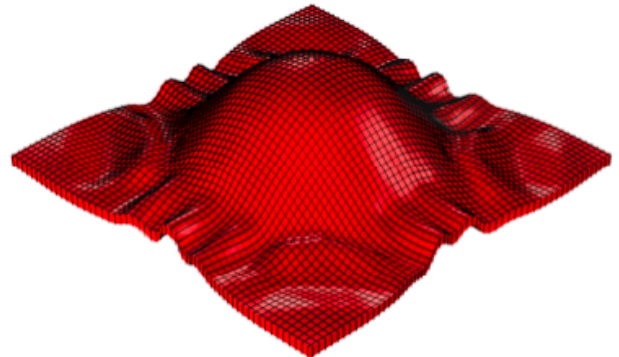


1st gradient model ($\alpha = 0$ N)



Professor Philippe Boisse

The middle image above is from: Boisse P, Hamila N, Madeo A, “Modelling the development of defects during composite reinforcements and prepreg forming”, *Philos Trans R Soc A Math Phys Eng Sci* 374:20150269, 2016 <https://doi.org/10.1098/rsta.2015.0269>

The right-most image above is from: Gabriele Barbagallo, Angela Madeo, Fabrice Morestin and Philippe Boisse, “Modeling the deep drawing of a 3D woven fabric with a second gradient model”, arXiv:submit/1594505 [math-ph] 22 Jun 2016

See:

https://www.researchgate.net/profile/Philippe_Boisse/4

<https://loop.frontiersin.org/people/180839/overview>

<https://scholar.google.com/citations?user=vgUrPg4AAAAJ&hl=en>

Mechanical Engineering, LaMCoS, INSA de Lyon, University of Lyon, Villeurbanne, France

Selected Publications:

Boisse P, Danel JL, Gelln JC. A simple isoparametric three-node shell finite element. *Computers and Structures* 1992; 44(6):1263-1273.

Boisse P, Daniel JL, Gelin JC. A Co three-node shell element for non-linear structural analysis. *International Journal for Numerical Methods in Engineering* 1994; 37:2339-2364.

Philippe Boisse, A. Hakim Cherouat, Jean Claude Gelin, and Hamid Sabhi. Experimental study and finite element simulation of a glass fiber fabric shaping process. *Polymer composites*, 16(1):83–95, 1995.

P. Boisse, J.C. Gelin, J.L. Daniel. Computation of thin structures at large strains and large rotations using a simple Co isoparametric three-node shell element. *Comput. Struct.*, 58, 249–261, 1996.

M.L. Boubakar, P. Boisse, J.C. Gelin. Numerical implementation of orthotropic plasticity for sheet-metal forming analysis. *J. Mat. Proc. Tech.*, 65, 143–152, 1997.

Ganapathi M, Boisse P and Solaut D (1999), Non-linear dynamic stability analysis of composite laminates under periodic in-plane loads, *International Journal of Numerical Methods in Engineering*, 46, 943-956.

A. Gasser, P. Boisse and S. Hanklar. Mechanical behaviour of dry fabric reinforcements. 3D simulations versus biaxial tests. *Computational Materials Science*. 17: 7–20, 2000

Ganapathi M, Patel BP, Boisse P and Touratier M (2000), Non-linear dynamic stability characteristics of elastic plates subjected to periodic in-plane load, *International Journal of Non-linear Mechanics*, 35(3), 467-480.

Philippe Boisse, K. Buet, Alain Gasser, and Jean Launay. Meso/macro-mechanical behaviour of textile reinforcements for thin composites. *Composites Science and Technology*, 61(3):395–401, 2001.

Philippe Boisse, Bassem Zouari, and Alain Gasser. A mesoscopic approach for the simulation of woven fibre composite forming. *Composites Science and Technology*, 65(3-4):429–436, 2005.

Bassem Zouari, Jean-Luc Daniel, and Philippe Boisse. A woven reinforcement forming simulation method. Influence of the shear stiffness. *Computers & Structures*, 84(5-6):351–363, 2006.

D. Soulat, A. Cheruet, P. Boisse. Simulation of continuous fibre reinforced thermoplastic forming using a shell finite element with transverse stress. *Comput. Struct.*, 84, 888–903, 2006.

Philippe Boisse, Bassem Zouari, and Jean-Luc Daniel. Importance of in-plane shear rigidity in finite element analyses of woven fabric composite preforming. *Composites Part A: Applied Science and Manufacturing*, 37(12):2201–2212, 2006.

Boisse P. Finite element analysis of composite forming. In: Long AC, editor. *Composite forming technologies*. Woodhead Publishing Limited, 2007.

Hamila, N., & Boisse, P. (2007). A meso–macro three node finite element for draping of textile composite preforms. *Applied Composite Materials*, 14(4), 235–250.

Philippe Boisse, Nahiène Hamila, F. Helenon, B. Hagege, and Jian Cao. Different approaches for woven composite reinforcement forming simulation. *International Journal of Material Forming*, 1(1):21–29, 2008.

] Wonoh Lee, J. Padvoiskis, Jian Cao, Emmanuel de Luycker, Philippe Boisse, Fabrice Morestin, J. Chen, and James Sherwood. Bias-extension of woven composite fabrics. *International Journal of Material Forming*, 1(SUPPL. 1):895–898, 2008

Jian Cao, Remko Akkerman, Philippe Boisse, Julie Chen, H. S. Cheng, E. F. de Graaf, J. L. Gorczyca, Philip Harrison, Gilles Hivet, Jérôme Launay, Wonoh Lee, L. Liu, Stepan V. Lomov, Andrew C. Long, Emmanuel de Luycker, Fabrice Morestin, J. Padvoiskis, X. Q. Peng, James Sherwood, T. Stoilova, Xiaoming M. Tao, I. Verpoest, A. Willems, J. Wiggers, T. X. Yu, and B. Zhu. Characterization of mechanical behavior of woven fabrics: Experimental methods and benchmark results. *Composites Part A: Applied Science and Manufacturing*, 39(6):1037–1053, 2008.

Badel, P., Vidal-Sallé, E., & Boisse, P. (2008). Large deformation analysis of fibrous materials using rate constitutive equations. *Computers & Structures*, 86(11), 1164–1175

P. Badel, E. Vidal-Salle, E. Maire, and P. Boisse. Simulation and tomography analysis of textile composite reinforcement deformation at the mesoscopic scale. *Composites Science and Technology*, 68: 2433–2440, 2008.

Emmanuel de Luycker, Fabrice Morestin, Philippe Boisse, and David Marsal. Simulation of 3D interlock composite pre-forming. *Composite Structures*, 88:615–623, 2009.

Hamila, N., Boisse, P., Sabourin, F., & Brunet, M. (2009). A semi-discrete shell finite element for textile composite reinforcement forming simulation. *International journal for numerical methods in engineering*, 79(12), 1443–1466

Y. Aimène, E. Vidal-Sallé, B. Hagege, F. Sidoroff, P. Boisse, A hyperelastic approach for composite reinforcement large deformation analysis, *Journal of Composite Materials* 44 (2010) 5–26

Emmanuel de Luycker, Jean Guillaume Orliac, Fabrice Morestin, Philippe Boisse, David Marsal, and Stephane Otin. Experimental and numerical analyses of 3D interlock composite preforming. *International Journal of Material Forming*, 3(1):719–722, 2010.

Allaoui S, Boisse P, Chatel S, Hamila N, Hivet G, Soulat D, Vidal-Salle E: Experimental and numerical analyses of textile reinforcement forming of a tetrahedral shape. *Compos Part A* 2011, 42: 612–622

Boisse P, Hamila N, Vidal-Sallé E, Dumont F. 2011 Simulation of wrinkling during textile composite reinforcement forming. Influence of tensile, in-plane shear and bending stiffnesses. *Compos. Sci. Technol.* 71, 683–692.

Adrien Charmetant, Emmanuelle Vidal-Sallé, and Philippe Boisse. Hyperelastic modelling for mesoscopic analyses of composite reinforcements. *Composites Science and Technology*, 71(14):1623–1631, 2011.

A. Charmetant, J.G. Orliac, E. Vidal-Sallé, P. Boisse, Hyperelastic model for large deformation analyses of 3D interlock composite preforms, *Composites Science and Technology*, 72 (2012) 1352–1360

S. Bel, N. Hamila, P. Boisse, F. Dumont, Finite element model for NCF composite reinforcement preforming: Importance of inter-ply sliding, *Composites Part A* 43 (2012) 2269–2277

Hamila, N., & Boisse, P. (2013). Locking in simulation of composite reinforcement deformations. Analysis and treatment. *Composites Part A: Applied Science and Manufacturing*, 53, 109–117.

Gatouillat S, Bareggi A, Vidal-Sallé E, Boisse P. 2013 Meso modelling for composite preform shaping–simulation of the loss of cohesion of the woven fibre network. *Compos. Part A Appl. Sci. Manuf.* 54, 135–144.

Liang B, Hamila N, Peillon M, Boisse P. 2014 Analysis of thermoplastic prepreg bending stiffness during manufacturing and of its influence on wrinkling simulations. *Compos. Part A Appl. Sci. Manuf.* 67, 111–122.

Naouar, N., Vidal-Sallé, E., Schneider, J., Maire, E., & Boisse, P. (2014). Meso-scale FE analyses of textile composite reinforcement deformation based on X-ray computed tomography. *Composite Structures*, 116, 165–176.

Sylvain Mathieu, Philippe Boisse, Nahiène Hamila, and Florent Bouillon. Locking and stability of 3D woven composite reinforcements. *Key Engineering Materials*, 611-612:292–299, 2014.

M. Ferretti, A. Madeo, F. dell’Isola, P. Boisse, Modeling the onset of shear boundary layers in fibrous composite reinforcements by second-gradient theory, *Zeitschrift für angewandte Mathematik und Physik*, June 2014, Volume 65, Issue 3, pp 587-612

D’Agostino MV, Giorgio I, Greco L, Madeo A, Boisse P. 2015 Continuum and discrete models for structures including (quasi-) inextensible elasticae with a view to the design and modeling of composite reinforcements. *Int. J. Solids Struct.* 59, 1–17.

Madeo, A., Ferretti, M., Dell’Isola, F., & Boisse, P. (2015). Thick fibrous composite reinforcements behave as special second-gradient materials: three-point bending of 3D interlocks. *Zeitschrift für angewandte Mathematik und Physik*, 1-20.

Peng Wang, Xavier Legrand, Philippe Boisse, Nahiène Hamila, and Damien Soulat. Experimental and numerical analyses of manufacturing process of a composite square box part: Comparison between textile reinforcement forming and surface 3D weaving. *Composites Part B: Engineering*, 78:26–34, 2015.

Juan Pazmino, Sylvain Mathieu, Valter Carvelli, Philippe Boisse, and Stepan V. Lomov. Numerical modeling of forming of a non-crimp 3D orthogonal weave E-glass composite reinforcement. *Composites Part A: Applied Science and Manufacturing*, 72:207–218, 2015.

Mathieu, S., Hamila, N., Bouillon, F., & Boisse, P. (2015). Enhanced modeling of 3D composite preform deformations taking into account local fiber bending stiffness. *Composites Science and Technology*, 117, 322-333.

Naouar, N., Vidal-Salle, E., Schneider, J., Maire, E., & Boisse, P. (2015). 3D composite reinforcement meso FE analyses based on X-ray computed tomography. *Composite Structures*, 132, 1094-1104.

Angela Madeo, Manuel Ferretti, Francesco dell’Isola, and Philippe Boisse. Thick fibrous composite reinforcements behave as special second-gradient materials: three-point bending of 3D interlocks. *Zeitschrift für Angewandte Mathematik und Mechanik*, 66(4):2041–2060, 2015.

Sylvain Mathieu, Nahiène Hamila, F. Dupé, C. Descamps, and Philippe Boisse. Stability of 3D Textile Composite Reinforcement Simulations: Solutions to Spurious Transverse Modes. *Applied Composite Materials*, 2016.

Angela Madeo, Gabriele Barbagallo, Marco Valerio d’Agostino, and Philippe Boisse. Continuum and discrete models for unbalanced woven fabrics. *International Journal of Solids and Structures*, 2016.

Boisse P, Hamila N, Madeo A, “Modelling the development of defects during composite reinforcements and prepreg forming”, *Philos Trans R Soc A Math Phys Eng Sci* 374:20150269, 2016 <https://doi.org/10.1098/rsta.2015.0269>

Gabriele Barbagallo, Angela Madeo, Fabrice Morestin and Philippe Boisse, “Modeling the deep drawing of a 3D woven fabric with a second gradient model”, arXiv:submit/1594505 [math-ph] 22 Jun 2016

P. Boisse, J. Colmars, N. Hamila, N. Naouar and Q. Steer, “Bending and wrinkling of composite fiber preforms and prepregs. A review and new developments in the draping simulations”, *Composites Part B Engineering*, Vol. 141, pp 234-249, May 2018

Hu Xiong, Eduardo Guzman Maldonado, Nahiene Hamila and Philippe Boisse, “A prismatic solid-shell finite element based on a DKT approach with efficient calculation of through the thickness deformation”, *Finite Elements in Analysis and Design*, Vol. 151, pp 18-33, 15 October 2018