



Professor Andreas Apostolatos

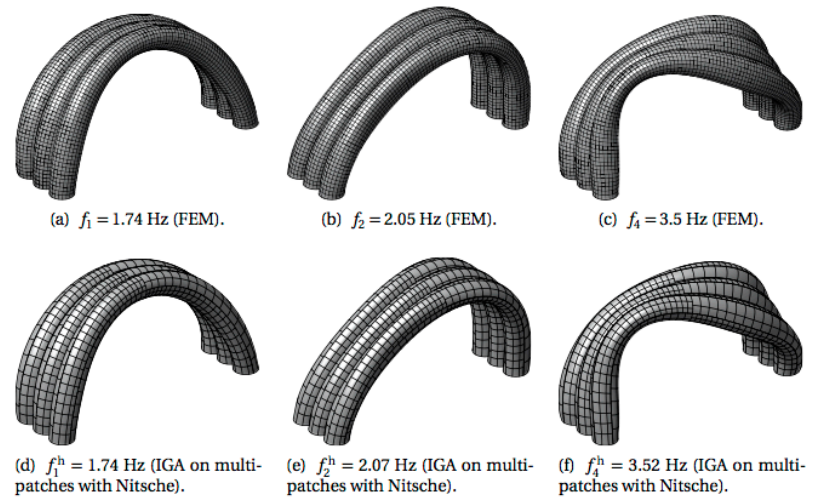


Figure 4.27: Inflatable hanger: Comparison of selected mode shapes between the reference FEM solution and the NURBS multipatch solution using the Nitsche-type method.

From: Andreas Apostolatos, “Isogeometric analysis of thin-walled structures on multipatch surfaces in fluid-structure interaction”, PhD Thesis, Technical University of Munich, 2018

See:

https://www.researchgate.net/profile/Andreas_Apostolatos

<https://scholar.google.com/citations?user=uE8GM4QAAAAJ&hl=en>

<https://www.st.bgu.tum.de/en/mitarbeiterinnen/andreas-apostolatos/>

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Summary:

Andreas does research in Isogeometric Analysis (IGA) on trimmed multipatches, linear and nonlinear Finite Element Analysis (FEA), partitioned Fluid-Structure Interaction (FSI) and applications. The current project he is working is 'EXAscale Quantification of Uncertainties for Technology and Science Simulation' (ExaQUte).

Research Interests:

Linear and nonlinear finite element methods

Nonconforming discretizations in isogeometric analysis

[Multipatch isogeometric analysis for lightweight structures with application to partitioned fluid-structure interaction](#)

Selected Publications:

A. Apostolatos, R. Schmidt, R. Wuechner, and K.-U. Bletzinger. A Nitsche-type formulation and comparison of the most common domain decomposition methods in isogeometric analysis. *International Journal for Numerical Methods in Engineering*, 97:473–504, 2013.

Apostolatos, A.; Wüchner, R.; Bletzinger, K.-U.: Non-matching grid transfer schemes for partitioned fluid-structure interaction simulations using isogeometric analysis. 5th GACM Colloquium on Computational Mechanics, Hamburg, 2013

Wüchner, R.; Wang, T.; Sicklinger, S.; Schmidt, R.; Apostolatos, A.; Bletzinger, K.-U.: Partitioned multifield simulation for analysis and design of free-form, light-weight structures subject to wind. *Advances in Computational Mechanics*, San Diego, 2013

Apostolatos, A.; Breitenberger, M.; Wüchner, R.; Bletzinger, K.-U.: A penalty formulation for coupling of Kirchhoff-Love shell multi-patches in isogeometric analysis. *Isogeometric Analysis and Applications*, Annweiler am Trifels, 2014

Breitenberger, M.; Apostolatos, A.; Chen, L.; Wüchner, R.; Bletzinger, K.-U.: Nonlinear Isogeometric B-Rep Analysis of Trimmed Multi-Surface CAD models for Realizing an Efficient Integrated Design-Through-Analysis Workflow in the CAD-CAE Software Siemens NX 8.5. *Isogeometric Analysis: Integrating Design and Analysis*, Austin, 2014

M. Breitenberger, A. Apostolatos, B. Philipp, R. Wuechner, and K.-U. Bletzinger. Analysis in computer aided design: Nonlinear isogeometric B-Rep analysis of shell structures. *Computer Methods in Applied Mechanics and Engineering*, 284:401–457, 2015.

Breitenberger, M.; Apostolatos, A.; Chen, L.; Wüchner, R.; Bletzinger, K.-U.: Realization of an Analysis in Computer Aided Design (AiCAD) Workflow in the CAD software Siemens NX 8.5 using the Isogeometric B-Rep Analysis. *Isogeometric Analysis and Applications*, Annweiler am Trifels, 2014

Apostolatos, A.; Breitenberger, M.; Wüchner, R.; Bletzinger, K.-U.: Domain decomposition methods and Kirchhoff-Love shell multipatch coupling in isogeometric analysis. In: *Isogeometric Analysis and Applications 2014*. Springer International Publishing, 2015

Apostolatos, A.; Breitenberger, M.; Fabien, P.; Emiroglu, A.; Wüchner, R.; Bletzinger, K.-U.: Multipatch isogeometric analysis for thin-walled structures with application to partitioned fluid-structure interaction. 6th GACM Colloquium on Computational Mechanics, Aachen, 2015

M. Breitenberger, B. Philipp, A. Apostolatos, R. Wüchner, K.-U Bletzinger: Analyzing complex CAD models in a finite-element-like manner with the isogeometric B-Rep analysis. *IGA 2015*, Trondheim, 2015

Apostolatos, A.; Breitenberger, M.; Wüchner, R.; Bletzinger, K.-U.: A niche-type method for the multipatch coupling and the application of weak Dirichlet boundary conditions in transient nonlinear isogeometric membrane analysis. *High Order Finite Element and Isogeometric Methods 2016*, 2016

Apostolatos, A.; Péan, F.; Emiroglu, A.; Wüchner, R.; Bletzinger, K.-U.: An isogeometric mortar surface coupling method for trimmed multipatch cad geometries with application to fsi. 7th GACM Colloquium on Computational Mechanics, 2017

Emiroglu, A.; Apostolatos, A.; Wüchner, R.; Bletzinger, K.-U.: Regenerating cad Models with opencascade and pythonocc from numerical models with application to shape optimization. 7th GACM Colloquium on Computational Mechanics, 2017

Andreas Apostolatos, “Isogeometric analysis of thin-walled structures on multipatch surfaces in fluid-structure interaction”, PhD Thesis, Technical University of Munich, 2018

Apostolatos, A.; Wüchner, R.; Bletzinger, K. U.: Weak imposition of constraints for multipatch membrane structures in transient geometrically nonlinear isogeometric analysis. 89th GAMM Annual Meeting, Technical University of Munich, 2018

Apostolatos, A.; Emiroglu, A.; S., Shayegan; Wüchner, R.; K.-U., Bletzinger: IBRA in Partitioned FSI with Application to Aeroelastic Wind Turbine Simulations. *IGA 2018: Integrating Analysis and Design*, Austin, Texas, 2018

G. De Nayer, A. Apostolatos, J.N. Wood, K.U. Bletzinger and R. Wuechner, “Numerical studies on the instantaneous fluid-structure interaction of an air-inflated flexible membrane in turbulent flow”, *Journal of Fluids and Structures*, Vol. 82, pp 577-609, 2018

Apostolatos, Andreas; Nayer, Guillaume De; Bletzinger, Kai-Uwe; Breuer, Michael; Wüchner, Roland: Systematic evaluation of the interface description for fluid–structure interaction simulations using the isogeometric mortar-based mapping. *Journal of Fluids and Structures* 86, 2019, 368 – 399

Andreas Apostolatos, Kai-Uwe Bletzinger and Roland Wuechner, “Weak imposition of constraints for structural membranes in transient geometrically nonlinear isogeometric analysis on multipatch surfaces”, *Computer Methods in Applied Mechanics and Engineering*, Vol. 350, pp 938-994, 15 June 2019