

List of Publications, Prof. R. Mailach

(05/2022)

Book Contributions

Seume, J., und Mailach, R., 2020: Dubbel: Taschenbuch für den Maschinenbau (Hrsg.: Grote, K.-H., Bender, B., Göhlich, D.), Kapitel R1 „Grundlagen der Strömungsmaschinen“, Springer-Verlag, 26. Auflage.

Schmidt, R., Voigt, M., Mailach, R., 2019: “Latin Hypercube Sampling-Based Monte Carlo Simulation: Extension of the Sample Size and Correlation Control”, in: Hirsch C., Wunsch D., Szumbarski J., Łaniewski-WoŃk Ł., Pons-Prats J. (Eds.) “Uncertainty Management for Robust Industrial Design in Aeronautics”. Notes on Numerical Fluid Mechanics and Multidisciplinary Design, Vol 140. Springer.

Seume, J., und Mailach, R., 2018: Dubbel: Taschenbuch für den Maschinenbau (Hrsg.: Grote, K.-H., Bender, B., Göhlich, D.), Kapitel R1 „Grundlagen der Strömungsmaschinen“, Springer-Verlag, 25. Auflage.

Seume, J., und Mailach, R., 2014: Dubbel: Taschenbuch für den Maschinenbau (Hrsg.: Grote, K.-H., Feldhusen, J.), Kapitel R1 „Grundlagen der Strömungsmaschinen“, Springer-Verlag, 24. Auflage.

Mailach, R., 2009: “Unsteady Flow in Turbomachinery“, Habilitation, Technische Universität Dresden, also published as: ISBN 978-3-941298-92-7, TUDpress, 2010, Dresden, Germany.

Mailach, R., and Vogeler, K., 2006: “Blade Row Interaction in Axial Compressors, Part I: Periodical Unsteady Flow Field”, Von Kármán Institute for Fluid Dynamics (VKI), Lecture Series 2006-06 “Advances in Axial Compressor Aerodynamics”, ISBN 2-930389-68-0, May 15-18, 2006, Rhode-Saint-Genèse, Belgium.

Mailach, R., and Vogeler, K., 2006: “Blade Row Interaction in Axial Compressors, Part II: Unsteady Behaviour of Boundary Layer, Pressure Distribution and Excited Pressure Force of Compressor Blades”, Von Kármán Institute for Fluid Dynamics (VKI), Lecture Series 2006-06 “Advances in Axial Compressor Aerodynamics”, ISBN 2-930389-68-0, May 15-18, 2006, Rhode-Saint-Genèse, Belgium.

Mailach, R., 2001: „Experimentelle Untersuchung von Strömungsinstabilitäten im Betriebsbereich zwischen Auslegungspunkt und Stabilitätsgrenze eines vierstufigen Niedergeschwindigkeits-Axialverdichters“, Dissertation, Technische Universität Dresden, zugleich: Fortschritt-Berichte VDI, Reihe 7, Nr. 410, VDI-Verlag, Düsseldorf, Germany.

Journal Articles

Ventosa-Molina, J., Koppe, B., Lange, M., Mailach, R., and Fröhlich, J., 2022: “Effects of Rotation on the Flow Structure in a Compressor Cascade”, ASME Journal of Turbomachinery, Vol. 144, 081006.

Chen, X., Koppe, B., Lange, M., Chu, W., Mailach, R., 2021: “Rotating Instabilities in a Low-Speed Single Compressor Rotor Row with Varying Blade Tip Clearance”, Journal Energies 2021, 14, 8369. <https://doi.org/10.3390/en14248369>.

Koppe, B., Lange, M., and Mailach, R., 2021: “Influence of Boundary Layer Skew on the Tip Leakage Vortex of an Axial Compressor Stator”, ASME Journal of Turbomachinery, Vol. 143 (9), 091016.

Windemuth, C., Lange, M., and Mailach, R., 2021: "Investigation of Unsteady Pressure Fluctuations in a Simplified Steam Turbine Control Valve", ASME J. Eng. Gas Turbines Power. Aug 2021, 143(8): 081017.

Windemuth, C., Lange, M., and Mailach, R., 2021: "Analysis of the Unsteady Flow Field in a Steam Turbine Control Valve Using Spectral Proper Orthogonal Decomposition", Int. J. Turbomach. Propuls. Power 2021, 6, 11. <https://doi.org/10.3390/ijtpp6020011>

Engelmann, D., Sinkwitz, M., di Mare, F., Koppe, B., Mailach, R., Ventosa-Molina, J., Fröhlich, J., Schubert, T., Niehuis, R., 2021: "Near-Wall Flow in Turbomachinery Cascades - Results of a German Collaborative Project", Int. J. Turbomach. Propuls. Power 2021, 6, 9. <https://doi.org/10.3390/ijtpp6020009>.

Ventosa-Molina, J., Lange, M., Mailach, R., and Fröhlich, J., 2021: "Study of Relative Endwall Motion Effects in a Compressor Cascade Through Direct Numerical Simulations ", ASME Journal of Turbomachinery, Vol. 143 (1), 011005.

Böttger, M., Lange, M., Mailach, R., and Vogeler, K., 2020: "Experimental Study on the Influence of Film Cooling Hole Extraction on Heat Transfer and Flow Field in Internal Ribbed Cooling Channels of Turbine Blades", ASME Journal of Turbomachinery, Vol. 142 (10), 101005.

Högner, L., Voigt, M., Mailach, R., Meyer, M., and Gerstberger, U., 2020: "Probabilistic Finite Element Analysis of Cooled High-Pressure Turbine Blades - Part A: Holistic Description of Manufacturing Variability", ASME Journal of Turbomachinery, Vol. 142 (10), 101008.

Högner, L., Voigt, M., Mailach, R., Meyer, M., and Gerstberger, U., 2020: "Probabilistic Finite Element Analysis of Cooled High-Pressure Turbine Blades - Part B: Probabilistic Analysis", ASME Journal of Turbomachinery, Vol. 142 (10), 101009.

Böttger, M., Lange, M., Mailach, R., and Vogeler, K., 2019: "Experimental Study on the Influence of the Streamwise Position of Film Hole Extraction in Internal Ribbed Cooling Channels of Turbine Blades", Journal of the Global Power and Propulsion Society. 3: 580–591. <https://doi.org/10.33737/jgpps/110621>.

Sinkwitz, M., Winhart, B., Engelmann, D., di Mare, F. and Mailach, R., 2019: "On the Periodically Unsteady Interaction of Wakes, Secondary Flow Development, and Boundary Layer Flow in An Annular Low-Pressure Turbine Cascade: An Experimental Investigation", ASME Journal of Turbomachinery, Vol. 141 (9), 091001.

Voigt, P., Högner, L., Fiedler, B., Voigt, M., Mailach, R., Meyer, M., and Nasuf, A., 2019: "Comprehensive Geometric Description of Manufacturing Scatter of High Pressure Turbine Nozzle Guide Vanes for Probabilistic CFD Analysis", ASME Journal of Turbomachinery, Vol. 141 (8), 081002.

Sinkwitz, M., Winhart, B., Engelmann, D., di Mare, F. and Mailach, R., 2019: "Experimental and Numerical Investigation of Secondary Flow Structures in an Annular Low Pressure Turbine Cascade under Periodic Wake Impact - Part 1: Experimental Results", ASME Journal of Turbomachinery, Vol. 141, 021008.

Winhart, B., Sinkwitz, M., Schramm, A., Engelmann, D., di Mare, F. and Mailach, R., 2019: "Experimental and Numerical Investigation of Secondary Flow Structures in an Annular Low Pressure Turbine Cascade under Periodic Wake Impact - Part 2: Numerical Results", ASME Journal of Turbomachinery, Vol. 141, 021009.

Iseni, S., Micallef, D., Engelmann, D., Mailach, R., Nicke, E., and di Mare, F., 2018: "Influence of casing contouring on flutter boundaries of a jet engine fan ", CEAS Aeronautical Journal, DOI 10.1007/s13272-018-0351-y.

Lange, M., Rolfes, M., Mailach, R., and Schrapp, H., 2018: "Periodic Unsteady Tip Clearance Vortex Development in a Low-Speed Axial Research Compressor at Different Tip Clearances", ASME Journal of Turbomachinery, Vol. 140, 031005-1.

Rolfes, M., Lange, M., Vogeler, K., and Mailach, R., 2017: "Experimental and Numerical Investigation of a Circumferential Groove Casing Treatment in a Low Speed Axial Research Compressor at Different Tip Clearances", ASME Journal of Turbomachinery, Vol. 139 (12), 121009.

Rolfes, M., Lange, M., and Mailach, R., 2017, "Investigation of Performance and Rotor Tip Flow Field in a Low Speed Research Compressor with Circumferential Groove Casing Treatment at Varying Tip Clearance," International Journal of Rotating Machinery, Vol. 2017, Article ID 4631751, 2017. doi:10.1155/2017/4631751

Aulich, A.-L., Sauer, T., Iseni, S., Moreau, A., Peitsch, D., Mailach, R., Micallef, D., Enghardt, L., and Nicke, E., 2016: "Fan casing contouring under consideration of aeroacoustics, mechanics, aeroelasticity, and whole engine performance", CEAS Aeronautical Journal, 2016, DOI 10.1007/s13272-016-0226-z.

Lange, M., Vogeler, K., Mailach, R., and Elorza-Gomez, S., 2013: "An Experimental Verification of a New Design for Cantilevered Stators with Large Hub Clearances", ASME Journal of Turbomachinery, Vol. 135, No. 4, 041022.

Gottschall, M., Mailach, R., and Vogeler, K., 2012: "Penny Gap Effect on Performance and Secondary Flow Field in a Compressor Cascade", AIAA Journal of Propulsion and Power, Vol. 28, No. 5, Sept.–Oct. 2012, pp. 927-935.

Fischer, A., Büttner, L., Czarske, J., Gottschall, M., Vogeler, K., and Mailach, R., 2012: "Investigation of the tip clearance flow in a compressor cascade using a novel laser measurement technique with high temporal resolution", ASME Journal of Turbomachinery, Vol. 134, No. 3, 051004.

Künzelmann, M., Urban, R., Mailach, R., and Vogeler, K., 2011: "Active flow control at a 1.5 stage low speed research compressor with varying rotor tip clearance", (*Best Paper Award of the European Turbomachinery Committee 2011*), IMechE Journal of Power and Energy Part A: Journal of Power and Energy, Vol. 225, Issue 7, pp. 886-896.

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Müller, L., Mailach, R., Vogeler, K., Jia, H., and Xi, G., 2010: "Unsteady Blade Loading with Clocking in Multistage Axial Compressors, Part 2: Experimental Investigation", AIAA Journal of Propulsion and Power, Vol. 26, No. 1, pp. 36-45.

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Mailach, R., Lehmann, I., and Vogeler, K., 2008: "Periodical Unsteady Flow Within a Rotor Blade Row of an Axial Compressor - Part I: Flow Field at Midspan", ASME Journal of Turbomachinery, Vol. 130, pp. 041004-1 - 041004-10.

Mailach, R., Lehmann, I., and Vogeler, K., 2008: "Periodical Unsteady Flow Within a Rotor Blade Row of an Axial Compressor - Part II: Wake - Tip Clearance Vortex Interaction", ASME Journal of Turbomachinery, Vol. 130, pp. 041005-1 - 041005-10.

Jia, H., Vogeler, K., Müller, L., and Mailach, R., 2007: "Numerical Investigation of Rotor-Stator-Interactions in a 1.5-Stage Low-Speed Axial Compressor", Journal of Computational and Applied Mechanics (JCAM), Vol. 8, No. 1, pp. 71-83.

Mailach, R., and Vogeler, K., 2007: "Unsteady Aerodynamic Blade Excitation at the Stability Limit and During Rotating Stall in an Axial Compressor", ASME Journal of Turbomachinery, Vol. 129, pp. 503-511.

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Mailach, R., Lehmann, I., and Vogeler, K., 2001: "Rotating Instabilities in an Axial Compressor Originating from the Fluctuating Blade Tip Vortex", ASME Journal of Turbomachinery, Vol. 123, pp. 453-463.

Conference Papers

Ventosa-Molina, J., Koppe, B., Lange, M., Mailach, R., and Fröhlich, J., 2021: "Effects of Rotation on the Flow Structure in a Compressor Cascade", ASME Paper No. GT2021-58793, ASME Turbo Expo, June 7 – 11, 2021, Virtual, Online.

Chen, X., Koppe, B., Lange, M., Chu, W., Mailach, R., 2021: "Performance of Unsteady Reynolds-Averaged Navier-Stokes and Hybrid Scale-Resolving Simulation Approaches in Simulating a Low-Speed Axial Compressor Single Rotor", ASME Paper No. GT2021-59028, ASME Turbo Expo, June 7 – 11, 2021, Virtual, Online.

Schuchard, L., Dumstorff, P., Voigt, M., De Lazzer, A., Almstedt, H., Mailach, R., 2021: "Improved Rotor Design With Combined 3d-2d Probabilistic Approach", ASME Paper No. GT2021-58620, ASME Turbo Expo, June 7 – 11, 2021, Virtual, Online.

Prots, A., Voigt, M., Magin, P., Danner, F., Mailach, R., 2021: "Probabilistic Approach for Optimizing Uncertainties of Input Variables to Reach a Desired Confidence Level", ASME Paper No. GT2021-59442, ASME Turbo Expo, June 7 – 11, 2021, Virtual, Online.

Windemuth, C., Lange, M., and Mailach, R., 2021: "Analysis of the Unsteady Flow Field in a Steam Turbine Control Valve Using Spectral Proper Orthogonal Decomposition", Paper No. ETC2021-561, 14th European Turbomachinery Conference, April 12-16, 2021, Gdansk, Poland.

Ventosa-Molina, J., Lange, M., Mailach, R., and Fröhlich, J., 2020: "Study of Relative Endwall Motion Effects in a Compressor Cascade through Direct Numerical Simulations", ASME Paper No. GT2020-14612, ASME Turbo Expo, Sept. 21-25, 2020, Virtual, Online.

Windemuth, C., Lange, M., and Mailach, R., 2020: "Investigation of Unsteady Pressure Fluctuations in a Simplified Steam Turbine Control Valve", ASME Paper No. GT2020-14632, ASME Turbo Expo, Sept. 21-25, 2020, Virtual, Online.

Voigt, P., Voigt, M., Mailach, R., Abu-Taa, K., and Rostamian, M., 2020: "Introduction of a Novel Parameter Model to Analyze the Geometric Variation of Airfoil Edges of Ex-In-Service Compressor Airfoils", ASME Paper No. GT2020-14668, ASME Turbo Expo, Sept. 21-25, 2020, Virtual, Online.

Schuchard, L.C., Cerutti, S., Voigt, M., and Mailach, R., 2020: "A Statistical Study on HCF Validation Data for Axial Gas Turbine Compressor Blades", ASME Paper No. GT2020-14946, ASME Turbo Expo, Sept. 21-25, 2020, Virtual, Online.

Koppe, B., Lange, M., and Mailach, R., 2020: "Influence of Boundary Layer Skew on the Tip Leakage Vortex of an Axial Compressor Stator", ASME Paper No. GT2020-15940, ASME Turbo Expo, Sept. 21-25, 2020, Virtual, Online.

Prots, A., Högner, L., Voigt, M., Mailach, R., and Danner, F., 2020: "Improved Quality Assessment of Probabilistic Simulations and Application to Turbomachinery", ASME Paper No. GT2020-16147, ASME Turbo Expo, Sept. 21-25, 2020, Virtual, Online.

Fiedler, B., Muller, Y., Voigt, M., and Mailach, R., 2020: "Comparison of Two Methods for the Sensitivity Analysis of a One-Dimensional Cooling Flow Network of a High Pressure Turbine Blade", ASME Paper No. GT2020-16295, ASME Turbo Expo, Sept. 21-25, 2020, Virtual, Online.

Högner, L., Voigt, M., Mailach, R., Meyer, M., and Gerstberger, U., 2019: "Probabilistic FE-Analysis of Cooled High Pressure Turbine Blades: Part A – Holistic Description of Manufacturing Variability", ASME Paper No. GT2019-91205, ASME Turbo Expo, June 17-21, 2019, Phoenix, AZ, USA.

Högner, L., Voigt, M., Mailach, R., Meyer, M., and Gerstberger, U., 2019: "Probabilistic FE-Analysis of Cooled High Pressure Turbine Blades: Part B – Probabilistic Analysis", ASME Paper No. GT2019-91214, ASME Turbo Expo, June 17-21, 2019, Phoenix, AZ, USA.

Magin, P., Danner, F., Voigt, M., and Mailach, R., 2019: "High Pressure Compressor Aerodynamic Performance at Uncertain Boundary Conditions", ASME Paper No. GT2019-90908, ASME Turbo Expo, June 17-21, 2019, Phoenix, AZ, USA.

Voigt, P., Voigt, M., Mailach, R., Münzinger, D., Abu-Taa, K., and Lange, A., 2019: "A Novel Methodology for Detecting Foreign Object Damage on Compressor Blading", ASME Paper No. GT2019- 90378, ASME Turbo Expo, June 17-21, 2019, Phoenix, AZ, USA.

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Böttger, M., Lange, M., Mailach, R., and Vogeler, K., 2019: "Experimental Study on the Influence of the Streamwise Position of Film Hole Extraction in Internal Ribbed Cooling Channels of Turbine Blades", GPPS Technical Conference 2019, Paper No. GPPS-TC-2019-0019, Jan. 16-17, 2019, Zurich, Switzerland.

Sinkwitz, M., Winhart, B., Engelmann, D., di Mare, F., and Mailach, R., 2018: "On the Periodically Unsteady Interaction of Wakes, Secondary Flow Development and Boundary Layer Flow in an Annular LPT Cascade. Part 1: Experimental Investigation", ASME Paper No. GT2018- 76802, ASME Turbo Expo, June 11-15, 2018, Oslo, Norway.

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Voigt, P., Högner, L., Fiedler, B., Voigt, M., Mailach, R., Nasuf, A., Meyer, M., Berridge, C., and Goenaga, F., 2018: "Comprehensive Geometric Description of Manufacturing Scatter of High Pressure Turbine Nozzle Guide Vanes for Probabilistic CFD Analysis", ASME Paper No. GT2018-76723, ASME Turbo Expo, June 11-15, 2018, Oslo, Norway.

Kniefs, M., Lange, M., Mailach, R., Iseni, S., Micallef, D., and di Mare, F., 2018: "The Influence of Circumferential Grooves on the Flutter Stability of a Transonic Fan", ASME Paper No. GT2018- 76422, ASME Turbo Expo, June 11-15, 2018, Oslo, Norway.

Hodzic, O., Winhart, B., Sinkwitz, M., Engelmann, D., di Mare, F., and Mailach, R., 2018: "Experimental and Numerical Investigations of a Low-Pressure Turbine Control Stage", GPPS Forum 18, Paper No. GPPS-2018-98, May 7-9, 2018, Montreal, Canada.

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Kowalski, J., Lauer, M., Engelmann, D., Cagna, M., Mailach, R., and di Mare, F., 2017: „Development of a Novel Test Rig to Investigate Explosion Safety in Gas Turbine Enclosures", ISROMAC: International Symposium on Transport Phenomena and Dynamics of Rotating Machinery, Dec. 16-21, 2017, Maui, Hawaii, USA.

Sinkwitz, M., Winhart, B., Engelmann, D., di Mare, F., and Mailach, R., 2017: „ Experimental and Numerical Investigation of Secondary Flow Structures in an Annular LPT Cascade under Periodical Wake Impact – Part 1: Experimental Results“, ISROMAC: International Symposium on Transport Phenomena and Dynamics of Rotating Machinery, Dec. 16-21, 2017, Maui, Hawaii, USA.

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Izeni, S., Micallef, D., Engelmann, D., Mailach, R., Nicke, E., and di Mare, F., 2017: “Influence of Casing Contouring on Flutter Boundaries of a Jet Engine Fan”, Deutscher Luft- und Raumfahrtkongress, Paper No. 450105, 05.-07. Sept. 2017, München, Germany.

Reuter, I., Voigt, M., Mailach, R., Becker, K.-H., Fischersworing-Bunk, A., Schlums, H., and Ivankovic, M., 2017: “Strukturmechanische Blisk-Auslegung unter Verwendung von Metamodellen”, Deutscher Luft- und Raumfahrtkongress, Paper No. 450129, 05.-07. Sept. 2017, München, Germany.

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Backhaus, T., Maywald, T., Schrape, S., Voigt, M., and Mailach, R., 2017: “A Parametrization Describing Blisk Airfoil Variations Referring to Modal Analysis”, ASME Paper No. GT2017-64243. ASME Turbo Expo, June 26-30, 2017, Charlotte, NC, USA.

Knebel, S., Baum, O., Högner, L., Voigt, M., Mailach, R., and Meyer, M., 2017: “Robust Detection and Characterization of Cooling Holes Based on Surface Meshes of Turbine Blades”, ASME Paper No. GT2017-64776. ASME Turbo Expo, June 26-30, 2017, Charlotte, NC, USA.

Högner, L., Knebel, S., Voigt, M., Mailach, R., and Meyer, M., 2017: “Quantification of X-Ray Measurement Uncertainty Based on Optical Measurement Data of Turbine Blades”, ASME Paper No. GT2017-63704. ASME Turbo Expo, June 26-30, 2017, Charlotte, NC, USA.

Rolfes, M., Lange, M., Vogeler, K., and Mailach, R., 2017: “Experimental and Numerical Investigation of a Circumferential Groove Casing Treatment in a Low Speed Axial Research Compressor at Different Tip Clearances”, ASME Paper No. GT2017-63051. ASME Turbo Expo, June 26-30, 2017, Charlotte, NC, USA.

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Sinkwitz, M., Engelmann, D., and Mailach, R., 2017: "Experimental Investigation of Periodically Unsteady Wake Impact on the Secondary Flow in a 1.5 Stage Full Annular LPT Cascade With Modified T106 Blading", ASME Paper No. GT2017-64390. ASME Turbo Expo, June 26-30, 2017, Charlotte, NC, USA.

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Beschorner, A., Lange, M., Mailach, R., and Vogeler, K., 2017: "Experimental and Numerical Investigation of a Low Aspect Ratio Transonic Linear Turbine Cascade", Paper No. ETC2017-237, 12th European Turbomachinery Conference, April 3-7, 2017, Stockholm, Sweden.

Reuter, I., M. Voigt, R. Mailach, K.-H. Becker, A. Fischersworing-Bunk, H. Schlums, and M. Ivankovic. „Moving Least Squares Metamodels - Hyperparameter, Variable Reduction and Model Selection“. In 14th International Probabilistic Workshop, Eds.: R. Caspeele, L. Taerwe, and D. Proske, 63–80. Cham: Springer International Publishing, 2017. http://dx.doi.org/10.1007/978-3-319-47886-9_5.

Iseni, S., Micallef, D., and Mailach, R., 2016: "Investigation of Inlet Distortion on the Flutter Stability of a Highly Loaded Transonic Fan Rotor", ASME Paper No. GT2016-56593. ASME Turbo Expo, June 13-17, 2016, Seoul, South Korea.

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Aulich, A.-L., Sauer, T., Iseni, S., Moreau, A., Nicke, E., Peitsch, D., Mailach, R., Micallef, D., and Enghardt, L., 2015: "Fan Casing Contouring under Consideration of Aeroacoustics, Mechanics, Aeroelasticity and Whole Engine Performance", Deutscher Luft- und Raumfahrtkongress, September, 22-24, Rostock, Germany.

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