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Research Publications

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I. Guest Editor

1. Kiefer, B., Marschner, U. and Mahmoodi, N., 2017. *Special Issue: ASME 2015 Conference on Smart Materials, Adaptive Structures and Intelligent Systems, Symposium on Modeling, Simulation and Control*, Journal of Intelligent Material Systems and Structures **28**(16).
2. Keip, M.-A., Kiefer, B., Schröder, J. and Linder, C., 2016. *Special Issue: Phase Field Approaches to Fracture*, Computer Methods in Applied Mechanics and Engineering **312**.
3. Koo, J.-H., Kiefer, B. and Marschner, U., 2016. *Special Issue: ASME 2014 Conference on Smart Materials, Adaptive Structures and Intelligent Systems, Symposium on Modeling, Simulation and Control*, Journal of Intelligent Material Systems and Structures **27**(14).
4. Schröder, J., Lupascu, D. C., Kiefer, B. and Keip, M.-A., 2015. *Topical Issue: Ferroic Functional Materials*, GAMM-Mitteilungen **38**(1).
5. Dragoni, E., Kiefer, B. and Koo, J.-H, 2015. *Special Issue: ASME 2013 Conference on Smart Materials, Adaptive Structures and Intelligent Systems, Symposium on Modeling, Simulation and Control*, Journal of Intelligent Material Systems and Structures **26**(6).

II. Book Chapters

1. Prüger, S. and Kiefer, B., 2020. *Towards the Crystal Plasticity Based Modeling of TRIP-Steels — From Material Point to Structural Simulations*. In: Biermann, H., Aneziris C. G. (Editors) *Austenitic TRIP/TWIP Steels and Steel-Zirconia Composites — Design of Tough, Transformation-Strengthened Composites and Structures*, Springer Series in Materials Science, vol. 298, chapter 24, 793-823, Springer International Publishing, Cham.
2. Kiefer, B., Lagoudas, D. C., 2008. *Modeling of Magnetic SMA*. In: Lagoudas, D.C. (Editor), *Introduction to Modeling and Engineering Applications of Shape Memory Alloys*, Springer-Verlag, New York.

III. Refereed Journal Publications (Peer Reviewed)

1. Bartel, T., Kiefer, B. and Menzel, A., 2020. *An Energy-Relaxation-Based Framework for the Modelling of Magnetic Shape Memory Alloys — Simulation of Three-Dimensional Effects Under Homogeneous Loading Conditions*, International Journal of Solids and Structures **208-209**, 221-234.
2. Prüger, S. and Kiefer, B., 2020. *A Comparative Study of Integration Algorithms for Finite Single Crystal (Visco-) Plasticity*, International Journal of Mechanical Sciences **180**, 105740.
3. Qayyum, F., Guk, S., Prüger, S., Schmidtchen, M., Saenko, I., Kiefer, B., Kawalla, R. and Prahl, U., 2020. *Investigating the Local Deformation and Transformation Behavior of Sintered X3CrMnNi16-7-6 TRIP Steel Using a Tuned Crystal Plasticity-Based Numerical Simulation Model*, Zeitschrift für Metallkunde: International Journal of Materials Research **111**(5), 392-404.
4. Abendroth, M., Hütter, G., Settgast, C. Malik, A., Kiefer, B. and Kuna, M., 2020. *A Hybrid Approach to Describe the Elastic-Plastic Deformation Behavior of Porous Media Including Damage Effects*, Technische Mechanik **40**(1), 5-14.
5. Benaarbia, A., Chatzigeorgiou, G., Kiefer, B. and Meraghni, F., 2019. A Fully Coupled Thermo-Viscoelastic-Viscoplastic-Damage Framework to Study the Cyclic Variability of the Taylor-Quinney Coefficient for Semi-Crystalline Polymers, International Journal of Mechanical Sciences **163**, 105128.
6. Bartel, T., Kiefer, B., Buckmann, K. and Menzel, A., 2019. *An Energy-Relaxation-Based Framework for the Modelling of Magnetic Shape Memory Alloys — Simulation of Key Response Features Under Homogeneous Loading Conditions*, International Journal of Solids and Structures **182-183**, 162-178.

7. Buckmann, K., Kiefer, B., Bartel, T. and Menzel, A., 2019. *Simulation of Magnetised Microstructure Evolution Based on a Micromagnetics-Inspired FE-Framework: Application to Magnetic Shape Memory Behaviour*, Archive of Applied Mechanics **89**(6), 1085-1102.
8. Bartel, T., Schulte, R., Menzel, A., Kiefer, B. and Svendsen, B., 2019. *Investigations on Enhanced Fischer-Burmeister NCP Functions — Application to a Rate-Dependent Model for Ferroelectrics*, Archive of Applied Mechanics **89**(6), 995-1010.
9. Zielke, H., Abendroth, M., Kuna, M. and Kiefer, B., 2018. *Determining the Fracture Toughness of Ceramic Filter Materials Using the Miniaturized Chevron-Notched Beam Method at High Temperature*, Ceramics International **44**(12), 13986-13993.
10. Hartl, D. J., Kiefer, B., Schulte, R. and Menzel, A., 2018. *Computationally-Efficient Modeling of Inelastic Single Crystal Responses via Anisotropic Yield Surfaces: Applications to Shape Memory Alloys*, International Journal of Solids and Structures **136-137**, 38-59.
11. Kiefer, B., Waffenschmidt, T., Sprave, L. and Menzel, A., 2018. *A Gradient-Enhanced Damage Model Coupled to Plasticity — Multi-Surface Formulation and Algorithmic Concepts*, International Journal of Damage Mechanics **27**(2), 253-295.
12. Kiefer, B., Furlan, T. and Mosler, J., 2017. *A Numerical Convergence Study Regarding Homogenization Assumptions in Phase Field Modeling*, International Journal for Numerical Methods in Engineering, **112**(9), 1097-1128.
13. Ehlers, W., Govindjee, S., Keip, M.-A., Kiefer, B., Linder, C. and Schröder, J., 2017. *In Memoriam of Christian Miehe*, Mechanics Research Communications **80**, 3.
14. Haldar, K., Kiefer, B. and Menzel, A., 2016. *Finite Element Simulation of Rate-Dependent Magneto-Active Polymer Response*, Smart Materials and Structures **25**(10), 104003.
15. Peraza Hernandez, E. A., Kiefer, B., Hartl, D. J., Menzel, A. and Lagoudas, D. C., 2015. *Analytical Investigation of Structurally Stable Configurations in Shape Memory Alloy-Actuated Plates*, International Journal of Solids and Structures **69-70**, 442-458.
16. Potdar, B., Graff, S. and Kiefer, B., 2015. *Numerical Analysis and Experimental Validation of the Thermomechanical Flow Behaviour of the Hot Stamping Steel MBW 1500*, Key Engineering Materials **639**, 213-220.
17. Schröder, J., Labusch, M., Keip, M.-A., Kiefer, B., Brands, D. and Lupascu, D. C., 2015. *Computation of Magneto-Electric Product Properties for 0-3 Composites*, GAMM-Mitteilungen **38**(1), 8-24.
18. Kiefer, B., Buckmann, K. and Bartel, T., 2015. *Numerical Energy Relaxation to Model Microstructure Evolution in Functional Magnetic Materials*, GAMM-Mitteilungen **38**(1), 171-195.
19. Bartel, T., Kiefer, B., Buckmann, K. and Menzel, A., 2015. *A Kinematically-Enhanced Relaxation Scheme for the Modeling of Displacive Phase Transformations*, Journal of Intelligent Material Systems and Structures **26**(6), 701-717.
20. Potdar, B., Graff, S., Kiefer, B. and Merklein, M., 2014. *Inverse Optimisation to Identify the Viscothermoplastic Behaviour of Manganese-Boron Steels for the Simulation of Hot Stamping*, Steel Grips, DOI 10.5161/STEEL/2014/sg14005.
21. Jarali, C. S., Basavaraddi, S. R., Kiefer, B., Pilli, S. C. and Lu. C., 2014. *Modeling of the Effective Elastic Properties of Multifunctional Carbon Nanocomposites Due to Agglomeration of Straight Circular Carbon Nanotubes in a Polymer Matrix*, Journal of Applied Mechanics **81**(2), 021010.
22. Kiefer, B., Bartel, T. and Menzel, A., 2012. *Implementation of Numerical Integration Schemes for the Simulation of Magnetic SMA Constitutive Response*, Smart Materials and Structures **21**(9), 094007.
23. Haldar, K., Kiefer, B. and Lagoudas, D. C., 2011. *FE-Analysis of the Demagnetization Effect and Stress Inhomogeneities in MSMA Samples*. Philosophical Magazine **91**(32), 4126-4157.
24. Jarali, C. S., Raja, S. and Kiefer, B., 2011. *Modelling the Effective Properties and Thermomechanical Behaviour of SMA-SMP Multifunctional Composite Laminates*. Polymer Composites **32**(6), 910-927.
25. Miehe, C., Rosato, D. and Kiefer, B., 2011. *Variational Principles in Dissipative Electro-Magneto-Mechanics: A Framework for the Macro-Modeling of Functional Materials*, International Journal for Numerical Methods in Engineering 86(10), 1225-1276.
26. Miehe, C., Kiefer, B. and Rosato, D., 2011. *An Incremental Variational Formulation of Dissipative Magnetostriction at the Macroscopic Continuum Level*, International Journal of Solids and Structures 48(13), 1846-1866.
27. Kiefer, B. and Lagoudas, D. C., 2009. *Modeling the Coupled Strain and Magnetization Response of Magnetic Shape Memory Alloys under Magnetomechanical Loading Paths*. Journal of Intelligent Material Systems and Structures **20**, 143-170.
28. Kiefer, B. and Lagoudas, D. C., 2008. *Modeling of the Variant Reorientation in Magnetic Shape Memory Alloys under Complex Magnetomechanical Loading,* Material Science & Engineering A **481-482**, 339-342.

29. Kiefer, B., Karaca, H. E., Lagoudas, D. C. and Karaman, I., 2007. *Characterization and Modeling of the Magnetic Field-Induced Strain and Work Output in Ni_2MnGa Magnetic Shape Memory Alloys*. Journal of Magnetism and Magnetic Materials **312**(1), 164-175.
30. Kiefer, B. and Lagoudas, D. C., 2005. *Magnetic Field-Induced Martensitic Variant Reorientation in Magnetic Shape Memory Alloys*. Philosophical Magazine Special Issue: Recent Advances in Theoretical Mechanics **85**(33-35), 4289-4329.

IV. Papers in Conference Proceedings (Peer Reviewed and Non-Peer Reviewed)

1. Ganesh, R., Gesell, S., Kuna, M., Fedelich, B., Kiefer, B., 2021. *Numerische Berechnung von ΔCTOD bei thermomechanischer Ermüdungsrissausbreitung*, DVM-Bericht 253, 53. Tagung des Arbeitskreises Bruchmechanik und Bauteilsicherheit.
2. Hütter, G., Settgast, C., Lange, N., Abendroth, A., Kiefer, B., 2020. *A Hybrid Approach for the Multi-Scale Simulation of Irreversible Material Behavior Incorporating Neural Networks*, Proceedings in Applied Mathematics and Mechanics **20**(1), accepted.
3. Kiefer, B., Rheinbach, O., Roth, S., Röver, F., 2020. *Variational Methods and Parallel Solvers in Chemo-Mechanics*, Proceedings in Applied Mathematics and Mechanics **20**(1), accepted.
4. Prüger, S., Kiefer, B., 2020. *Mean-Field Homogenization Based Constitutive Modeling of Austenitic TRIP-Steels at the Single Crystal Scale*, Proceedings in Applied Mathematics and Mechanics **20**(1), accepted.
5. Kiefer, B., Bartel, T. and Menzel, A., 2020. *Achievements and Open Challenges in Modeling Microstructure Evolution in Magnetizable Solids via Energy Relaxation*. Oberwolfach-Workshop on the Mechanics of Materials: Towards Predictive Methods for Kinetics in Plasticity, Fracture, and Damage, Report 2020-13, 26-28, doi:10.4171/OWR/2020/13.
6. Selent, M., Abendroth, M., Kuna, M. and Kiefer, B., 2020. *Experimentelle und numerische Untersuchungen zum Kriechverhalten des warmfesten Chromstahls X10CrMoVNb9-1 mittels Small Punch Test*, DVM-Bericht 252, 52. Tagung des Arbeitskreises Bruchmechanik und Bauteilsicherheit, 167-176.
7. Roth, S., Kuna, M. and Kiefer, B., 2019. *Simulation of Fatigue with Cyclic Cohesive Zone Models*, Proceedings of the 8th GACM Colloquium on Computational Mechanics for Young Scientists from Academia and Industry, 2019.
8. Prüger, S. and Kiefer, B., 2019. *On the Robustness of Stress Integration Algorithms for Finite Single Crystal (Visco)-Plasticity*, Proceedings in Applied Mathematics and Mechanics **19**(1), e201900129.
9. Chemisky, Y., Kiefer, B., Chatzigeorgiou, G., and Meraghni, F., 2019. *Modélisation numérique de la thermomécanique des mécanismes dissipatifs simultanés*, Proceedings of CSMA 2019, 14ème Colloque National en Calcul des Structures.
10. Roth, S. and Kiefer, B., 2019. *Simulation von Ermüdungsrissausbreitung mit einem zyklischen Kohäsivzonenmodell unter Nutzung einer Phasenfeldmodellierung*, DVM-Bericht, 51. Tagung des DVM-Arbeitskreises Bruchvorgänge, 2019.
11. Bartel, T., Kiefer, B., Buckmann, K. and Menzel, A., 2018. *A Finite-Element Framework for the Modelling and Simulation of Phase Transforming Magnetic Solids Using Energy Relaxation Concepts*, Proceedings in Applied Mathematics and Mechanics **18**(1), e201800415.
12. Schulte, R., Bartel, T., Menzel, A., Kiefer, B. and Svendsen, B., 2018. *Investigations on Different Fischer-Burmeister Functions Applied to the Modelling of Ferroelectrics*, Proceedings in Applied Mathematics and Mechanics **18**(1), e201800331.
13. Kiefer, B., Hein, J., Abendroth, M., Biermann, H., Henkel, S., Niendorf, T., Krooß, P. and Chemisky, Y., 2018. *On the Potential of Using the Small Punch Test for the Characterization of SMA Behavior Under Multi-Axial Loading Conditions*, Proceedings of the ASME 2018 Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS), vol. 1, paper 7973.
14. Selent, M., Abendroth, M., Kuna, M. and Kiefer, B., 2018. *Experimental Investigations on the Failure of a Coating-Substrate Compound by Means of the C-Specimen Concept and the Small Punch Test*, Proceedings of the 5th International Small Sample Test Techniques (SSTT) Conference 2018, 312-320.
15. Kiefer, B. and Bartel, T., 2017. On Variationally-Consistent Homogenization Approaches in Multi-Phase Magnetic Solids, Proceedings in Applied Mathematics and Mechanics **17**(1), 517-518.
16. Bartel, T., Kiefer, B., Buckmann, K. and Menzel, A., 2017. Towards a Micromagnetics-Inspired Framework for the Modelling of Variant Switching in Magnetic Shape Memory Alloys, Proceedings in Applied Mathematics and Mechanics **17**(1), 399-400.
17. Sprave, L. and Kiefer, B. and Menzel, A, 2016. *Computational Aspects of Transient Diffusion-Driven Swelling*, Proceedings (extended abstract) of the 29th Nordic Seminar on Computational Mechanics, 1-4.
18. Kiefer, B., Waffenschmidt, T., Sprave, L. and Menzel, A., 2016. *A Comparison of Algorithmic Approaches to Damage-Plasticity Modeling in the Context of Gradient-Enhancement*, Proceedings in Applied Mathematics and Mechanics **16**(1), 147-148.

19. Buckmann, K., Kiefer, B., Bartel, T. and Menzel, A., 2016. *Towards the Embedding of Relaxation-based Magnetostriction Models into a Micromagnetically-Motivated Finite Element Framework*, Proceedings in Applied Mathematics and Mechanics **16**(1), 433-434.
20. Kiefer, B., Haldar, K. and Menzel, A., 2015. *Modeling, Simulation and Parameter Identification for Rate-Dependent Magnetoactive Polymer Response*, Proceedings in Applied Mathematics and Mechanics **15**(1), 395-396.
21. Buckmann, K., Kiefer, B., Bartel, T. and Menzel, A., 2015. *Rank-One Convexification Approach for the Modeling of Magnetic Shape Memory Response*, Proceedings in Applied Mathematics and Mechanics **15**(1), 311-312.
22. Dusthakar, D. K., Bartel, T., Kiefer, B., Menzel, A. and Svendsen, B., 2014. *Rate-Dependent Laminate-Based Approach for Modelling of Ferroelectric Single Crystals*, Proceedings of the 5th International congress on Computational Mechanics and Simulation (ICCMS), 1324-1336.
23. Potdar, B., Graff, S., Kiefer, B., and Merklein, M., 2014. *Numerical Analysis and Experimental Validation of the Flow Behaviour of Manganese-Boron Steel at Elevated Temperatures*, Proceedings of the Forming Technology Forum 2014.
24. Kiefer, B., Buckmann, K., Bartel, T. and Menzel, A., 2014. *Modeling of Single Crystal Magnetostriction Based on Numerical Energy Relaxation Techniques*, Proceedings of the ASME 2014 Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS), paper 7436.
25. Labusch, M., Keip, M.-A., Kiefer, B. and Schröder, J., 2014. *Computation of Effective Non-linear Inelastic Properties of Magnetostrictive Composites*, Proceedings in Applied Mathematics and Mechanics **14**(1), 559-560.
26. Haldar, K., Kiefer, B. and Menzel, A., 2014. *Modeling and Simulation of Rate-Dependent Magneto-Active Polymers*, Proceedings in Applied Mathematics and Mechanics **14**(1), 401-401.
27. Buckmann, K., Kiefer, B., Bartel, T. and Menzel, A., 2014. *Modeling of Single Crystal Magnetostriction Based on Numerical Energy Relaxation Techniques,* Proceedings in Applied Mathematics and Mechanics **14**(1), 399-400.
28. Kiefer, B., Bartel, T. and Buckmann, K., 2014, *Modeling of Single Crystal Magnetostriction Based on Numerical Energy Relaxation Techniques,* Proceedings (extended abstract) of the 2nd Seminar on the Mechanics of Multifunctional Materials, Report No. 12, Institute of Mechanics, University of Duisburg-Essen, 7-10.
29. Haldar, K., Kiefer, B. and Menzel, A., 2014. *Constitutive Modeling of Magneto-Viscous Polymers,* Proceedings (extended abstract) of the 14th Pan-American Congress of Applied Mechanics (PACAM XIV).
30. Labusch, M., Keip, M.-A., Kiefer, B. and Schröder, J., 2014. *Computation of the Effective Magnetostrictive Coeffcient of Magneto-mechanically Coupled Composites*, Proceedings of 11th World Congress on Computational Mechanics (WCCM XI), paper 3803.
31. Bartel, T., Buckmann, K., Kiefer, B. and Menzel, A., 2013. *An Advanced Energy Relaxation Scheme for the Modeling of Displacive Phase Transformations*, Proceedings of the ASME 2013 Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS), paper 3041.
32. LaMaster, D., Feigenbaum, H. P., Kiefer, B., Ciocanel, C. and Nelson, I., 2013. *Thermodynamics-Based Model for Magnetic Shape Memory Alloys*, Proceedings (extended abstract) of the 4th International Conference on Ferromagnetic Shape Memory Alloys (ICFSMA) 2013.
33. Hartl, D. J., Kiefer, B. and Menzel, A., 2013. Modeling Shape Memory Alloy Single Crystalline Responses Using an Anisotropic Yield Surface, TMS 2013 Supplemental Proceedings, 975-986.
34. Lagoudas, D. C., Kiefer, B. and Haldar, K., 2009. *Magnetic Field-Induced Reversible Phase Transformation in Magnetic Shape Memory Alloys*. Proceedings of SPIE: Behavior and Mechanics of Multifunctional Materials and Composites, **7289**.
35. Kiefer, B., Rosato, D. and Miehe, C., 2009. *Geometrical Aspects of the Incorporation of Free Space in Magnetomechanics at Finite Strains*. Proceedings in Applied Mathematics and Mechanics **9**(1), 389-390.
36. Lagoudas, D. C., Kiefer, B. and Haldar, K., 2008. *Magneto-Mechanical Finite Element Analysis of Magnetic Shape Memory Alloys with Body Force and Body Couple*. Proceedings of ASME, Conference on Smart Materials, Adaptive Structures and Intelligent Systems 2008, paper SMASIS08-533, 1-10.
37. Kiefer, B., Rosato, D. and Miehe, C., 2008. *Finite Element Analysis of General Magnetomechanical Coupling Phenomena*. Proceedings in Applied Mathematics and Mechanics **8**(1), 10505-10506.
38. Kiefer, B., Rosato, D. and Miehe, C., 2008. *Modeling and Computational Analysis of Materials Exhibiting Intrinsic Magnetomechanical Coupling*. Proceedings of SPIE: Behavior and Mechanics of Multifunctional and Composite Materials, **6929**, 692920-1-12.
39. Kiefer, B., Rosato, D. and Miehe, C., 2007. *On the Modeling of Thermo-Electro-Magneto-Mechanical Solids at Finite Strains*. Proceedings in Applied Mathematics and Mechanics **7**(1), 4070025-4070026.
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41. Lagoudas, D. C., Kiefer, B. and Broederdorf, A. J., 2006. *Accurate Interpretation of Magnetic Shape Memory Alloy Experiments Utilizing Coupled Magnetostatic Analysis*. Proceedings of ASME, International Mechanical Engineering Congress and Exposition 2006, paper IMECE2006-15296, 311-321.
42. Kiefer, B. and Lagoudas, D. C., 2006. *Modeling of the Stress- and Magnetic Field-Induced Variant Reorientation in MSMAs.* Proceedings of AIAA 47th AIAA Structures, Structural Dynamics, and Materials Conference, paper 1766, 1-15.
43. Kiefer, B. and Lagoudas, D. C., 2006. *Application of a Magnetic SMA Constitutive Model in the Analysis of Magnetomechanical Boundary Value Problems*. Proceedings of SPIE, Smart Structures and Materials, **6170**, 330-341.
44. Kiefer, B. and Lagoudas, D. C., 2005. *Modeling of the Magnetic Field-Induced Martensitic Variant Reorientation and the Associated Magnetic Shape Memory Effect in MSMAs*. Proceedings of SPIE, Smart Structures and Materials, **5761**, 454-465.
45. Kiefer, B. and Lagoudas, D. C., 2004. *Phenomenological Modeling of Ferromagnetic Shape Memory Alloys*. Proceedings of SPIE, Smart Structures and Materials, **5387**, 164-176.