

Ronald Krueger's Biography

Dr. Krueger joined the National Institute of Aerospace (NIA) as a Senior Staff Scientist in January 2003 developing durability and damage tolerance analyses for composite structures using finite element analysis and fracture mechanics. Dr. Krueger is an accomplished presenter and awarded author of 49 technical papers published in refereed journals and international conference proceedings. His work has been cited more than 200 times in the open literature. In March 2005 he was awarded a Certificate of Appreciation by ASTM Committee D30 on Composite Materials for his outstanding effort as Chairman of the Workshop on Computational Fracture Mechanics held in Salt Lake City in March 2004. In September 2005 and March 2007 he received NASA Langley Research Center Team Awards for his outstanding performance and commitment.

Dr. Krueger received both his Diploma and his Doctorate degree in Aerospace Engineering from the University of Stuttgart, Germany, in 1989 and 1996, respectively, where he worked as a research and teaching assistant at the Institute for Statics and Dynamics of Aerospace Structures. For his dissertation, he investigated the post-buckling behavior of delaminated composites under cyclic tension and compression loading and developed a growth law to predict delamination propagation. During his tenure, he was assigned to a multinational European project on damage and life prediction of composite structures involving five partners including universities, research institutions and companies from three countries.

From August 2000 until December 2002 Dr. Krueger worked as a Staff Scientist at ICASE located at NASA Langley Research Center. There, he developed a methodology for determining the fatigue life of bonded composite skin/stringer structures using delamination fatigue characterization data and geometric nonlinear finite element analysis. Additionally he investigated the limitations of two-dimensional finite element models for the damage onset prediction for skin-stiffener debonding and verified the reliability of a shell/solid finite element modeling technique prior to its application to large, full-scale stringer stiffened panels. This work was awarded the best paper prize by the Australian Composite Structures Society in 2001.

Prior to joining ICASE Dr. Krueger held a NRC Post-Doctoral research position at NASA Langley Research Center. He joined the researchers at NASA in 1997 where he began his investigation of debond failure in composite skin/stringer configurations. His research focused on the development of an external post processing procedure to compute energy release rates from finite element result output. He used his results to correlate the experimentally observed failures using a mixed-mode interlaminar fracture criterion.

Dr. Krueger is a senior member of the American Institute for Aeronautics and Astronautics (AIAA) and a member of the American Society for Testing and Materials (ASTM) Committee D-30 on Composite Materials where he currently serves as vice-chair for sub-committee D30.02 on Research and Mechanics. He is also an active member of the American Society for Composites (ASC) and The Composites Materials Handbook (CMH-17) where he currently serves as co-chair for the Debonding and Delamination Task Group.

- [1] R. Krueger and P.J. Minguet, "Analysis of Composite Skin-Stiffener Debond Specimens using a Shell-3D Modeling Technique," *Composite Structures*, Vol. 8, pp. 41-59, 2007.
- [2] T.K. O'Brien and R. Krueger, "Influence of Compression and Shear on the Strength of Composite Laminates with Z-Pinned Reinforcement," *Applied Composite Materials*, Vol. 13, pp. 173-189, 2006.
- [3] R. Krueger, J.G. Ratcliffe, and P.J. Minguet, "Analysis of Composite Panel-Stiffener Debonding Using A Shell/3D Modeling Technique," NIA Report No. 2007-07, NASA/CR-2007-214879, 2007.
- [4] R. Krueger and D. Goetze, "Influence of Finite Element Software on Energy Release Rates Computed Using the Virtual Crack Closure Technique," NIA Report No. 2006-06, NASA/CR-214523, 2006.
- [5] R. Krueger and P. J. Minguet, "Analysis of Composite Panel-Stiffener Debonding Using a Shell/3D Modeling Technique," NIA Report No. 2006-02, NASA/CR-2006-214299, 2006.
- [6] T. K. O'Brien and R. Krueger, "Influence of Compression and Shear on the Strength of Composite Laminates with Z-Pinned Reinforcement," NASA/TM-2005-213768, ARL-TR-3524, 2005.
- [7] R. Krueger and P. J. Minguet, "Skin-Stiffener Debond Prediction Based on Computational Fracture Analysis," NIA Report No. 2005-06, NASA/CR-2005-213915, 2005.
- [8] R. Krueger, "Modeling of Unit-Cells with Z-Pins Using FLASH: Pre-Processing and Post-Processing," NIA Report No. 2005-01, NASA/CR-2005-213905, 2005.
- [9] I. L. Paris, R. Krueger, and T. K. O'Brien, "Effect of Assumed Damage and Location on the Delamination Onset Predictions for Skin-Stiffener Debonding," *AHS Journal*, vol. 49, pp. 501-507, 2004.
- [10] R. Krueger and P. J. Minguet, "Analysis of Composite Skin-Stiffener Debond Specimens Using a Shell/3D Modeling Technique and Submodeling," NIA Report No. 2004-04, NASA/CR-2004-212684, 2004.
- [11] R. Krueger, "Virtual Crack Closure Technique: History, Approach and Applications," *Applied Mechanics Reviews*, vol. 57, pp. 109-143, 2004.
- [12] T. K. O'Brien and R. Krueger, "Analysis of Flexure Tests for Transverse Tensile Strength Characterization of Unidirectional Composites," *Journal of Composites Technology and Research*, vol. 25, pp. 50-68, 2003.
- [13] T. K. O'Brien, A. D. Chawan, R. Krueger, and I. Paris, "Transverse Tension Fatigue Life Characterization of Carbon Epoxy Composites," *International Journal of Fatigue*, vol. 24, pp. 127-146, 2002.
- [14] R. Krueger, I. L. Paris, T. K. O'Brien, and P. J. Minguet, "Comparison of 2D Finite Element Modeling Assumptions with Results from 3D Analysis for Composite Skin-Stiffener Debonding," *Composite Structures*, vol. 57, pp. 161-168, 2002.
- [15] R. Krueger, I. L. Paris, T. K. O'Brien, and P. J. Minguet, "Fatigue Life Methodology for Bonded Composite Skin/Stringer Configurations," *Journal of Composites Technology and Research*, vol. 24, pp. 56-79, 2002.