

BEN DENOS Postdoctoral Researcher » bdenos@purdue.edu

Originally from Mission Viejo, CA, Ben received his B.S. Mechanical Engineering from Brigham Young University in 2011. Ben worked as an undergraduate research assistant for General Motor's International P.A.C.E. Formula 1 Project performing design and assembly of a formula 1 style race car with a CFRP monocoque, specifically assigned to rear wing design. While attending and after graduating from BYU he worked as an intern and then associate engineer at GeoStrut in Lindon Utah designing tooling, developing inspection methods, and analyzing lab and field test data for filament wound, open-lattice CFRP poles and towers. Ben left GeoStrut to work on his Master's Degree in Aeronautical and Astronautical Engineering Structures and Materials at Purdue University from 2012-2014 focusing on characterization of fiber orientation in compression molded "chopped" prepreg tape composites using computed tomography scans of entire parts and validation via optical microscopy. He continued this work under advisor, Dr. R. Byron Pipes, to improve CT scan fiber orientation analysis and data mapping methods, and received his Ph.D. in August 2017. Ben is now a Post-Doctoral Research Assistant in the Composites Manufacturing & Simulation Center.



Current Research Focus

- » Inspection of chopped fiber material systems via CT scan image analysis and optical microscopy to accurately characterize micro- and meso-structure.
- » Mapping of microstructural data to finite element meshes for "digital twin" simulations.
- » Digital image correlation for full field strain comparison of highly heterogeneous chopped composites for comparison with finite element simulation strain fields.

Research figures

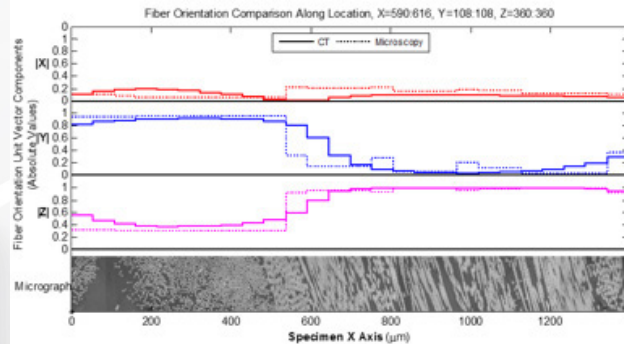


Figure 1. Visual Correlation of Microscopy and CT Data Fiber Orientation Components

Publications

- Denos, Benjamin. CT Scan Analysis for the Characterization of Fiber Orientation in Long Discontinuous Fiber Composite Materials. (Master's Thesis). 2014.
- Denos, Benjamin R., Pipes, R. Byron. Local Mean Fiber Orientation via Computer Assisted Tomography Analysis for Long Discontinuous Fiber Composites. 31st ASC Technical Conference and ASTM D30 Meeting, 2016.
- Denos, Benjamin. Fiber Orientation Measurement in Platelet-Based Composites Via Computed Tomography Analysis. (PhD Dissertation). 2017.

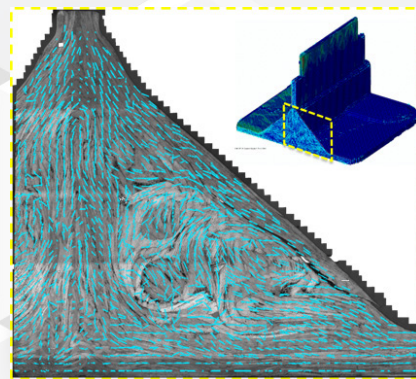


Figure 2 Element Material Orientation Vectors from CT Based FE Model Overlaying Micrograph of Same Location