



## Computational Simulation of Damage Propagation in Three-Dimensional Woven Composites

By Levon Minnetyan

BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 164 pages. Dimensions: 9.7in. x 7.4in. x 0.3in. Three dimensional (3D) woven composites have demonstrated multi-directional properties and improved transverse strength, impact resistance, and shear characteristics. The objective of this research is to develop a new model for predicting the elastic constants, hygrothermal effects, thermomechanical response, and stress limits of 3D woven composites; and to develop a computational tool to facilitate the evaluation of 3D woven composite structures with regard to damage tolerance and durability. Fiber orientations of weave and braid patterns are defined with reference to composite structural coordinates. Orthotropic ply properties and stress limits computed via micromechanics are transformed to composite structural coordinates and integrated to obtain the 3D properties. The various stages of degradation, from damage initiation to collapse of structures, in the 3D woven structures are simulated for the first time. Three dimensional woven composite specimens with various woven patterns under different loading conditions, such as tension, compression, bending, and shear are simulated in the validation process of this research. Damage initiation, growth, accumulation, and propagation to fracture are included in these simulations. This item ships from La Vergne, TN. Paperback.



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