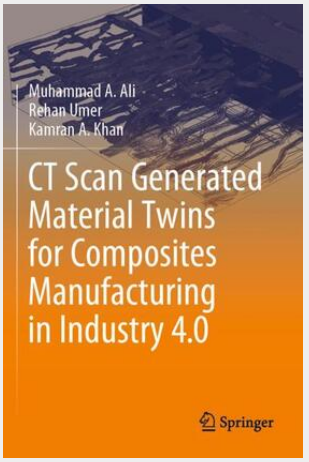
Ali / Khan / Umer

CT Scan Generated Material Twins for Composites Manufacturing in Industry 4.0



This book highlights a novel and robust platform in the form of in-situ characterization setup for creating X-ray computed tomography (XCT)-based textile material twins. In this hybrid experimental–numerical platform, XCT images of different complex fibrous reinforcements at different levels of compaction are acquired. The images are converted into computational models for resin flow simulations. The capabilities of this hybrid framework are applied to a variety of reinforcements used in liquid composite molding processes such as 2D, 3D fabrics and dry tapes. This book is a milestone in the development of virtual manufacturing protocols using material twins of textiles, providing a step closer to the digitalization of advanced composites used in manufacturing processes for industry 4.0.

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