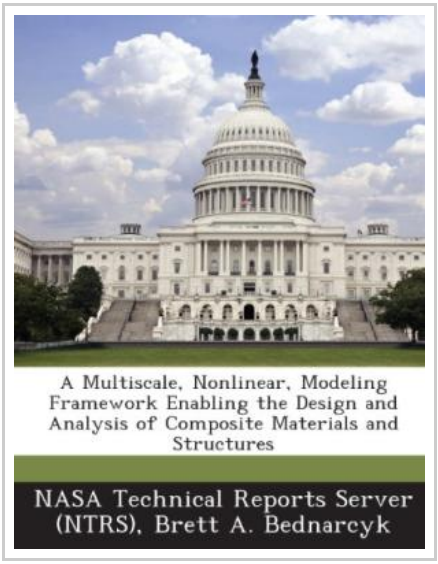

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A Multiscale, Nonlinear, Modeling Framework Enabling the Design and Analysis of Composite Materials and Structures

By Brett A Bednarcyk

Bibliogov, United States, 2013. Paperback. Book Condition: New. 246 x 189 mm. Language: English . Brand New Book ***** Print on Demand *****.A framework for the multiscale design and analysis of composite materials and structures is presented. The ImMAC software suite, developed at NASA Glenn Research Center, embeds efficient, nonlinear micromechanics capabilities within higher scale structural analysis methods such as finite element analysis. The result is an integrated, multiscale tool that relates global loading to the constituent scale, captures nonlinearities at this scale, and homogenizes local nonlinearities to predict their effects at the structural scale. Example applications of the multiscale framework are presented for the stochastic progressive failure of a SiC/Ti composite tensile specimen and the effects of microstructural variations on the nonlinear response of woven polymer matrix composites.

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