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The first set of numerical examples investigates the computational efficiency and accuracy of the proposed fatigue model. We consider the classical stress concentration problem--a thin plate with a centered small circular hole, as shown in Fig. 4. The plate is assumed to be composed of 0/0 ply of fibrous composite.

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Computational Mechanics of Fatigue and Life Predictions for Composite Materials and Structures Jacob Fish and Qing Yu Department of Civil Engineering, Mechanical and Aerospace Engineering Rensselaer Polytechnic Institute, Troy, NY 12180 Abstract A multiscale fatigue analysis model is developed for brittle composite materials. The mathematical

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structural mechanics (plates and shells), composite materials, computational fluid dynamics and heat transfer, and applied mathematics. His contributions to mechanics of composite materials and structures are well known through his research on refined plate and shell theories and their finite element models.

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Most methods in micromechanics of materials are based on continuum mechanics rather than on atomistic approaches such as nanomechanics or molecular dynamics. In addition to the mechanical responses of inhomogeneous materials, their thermal conduction behavior and related problems can be studied with analytical and numerical continuum methods. All these approaches may be subsumed under the name of "continuum micromechanics".

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