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Failure Mechanisms and Fatigue Life Prediction of Engineering Structures

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Message from the Guest Editors

Fatigue caused by constant or time-varying cyclic loading represents one of the most important types of failures to which materials, structural components, and structures are subjected during service life that can finally result in a sudden and unexpected fracture. Fatigue life prediction of materials and structural details can be modeled by deterministic and probabilistic analyses. Fatigue damage in metals generally initiates near the surface and spreads perpendicularly to the loading direction; this behavior is linked to cyclic plasticity and isotropic mechanical properties. On the other hand, composites with a polymer matrix exhibit orthotropic mechanical properties, favoring far more complex fatigue damage than in metallic materials, including matrix cracking, delamination, fiber rupture and failure occurring in a synergic, cumulative and random manner.



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Special Issue



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Message from the Editor-in-Chief

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