

Special Issue on Cumulation of Failure and Crack Growth in Materials

CALL FOR PAPERS

In order to ensure the safety and reliability of materials and structures, for example, in power and energy systems, structural integrity and lifetime prediction have become a hot topic of research. For many countries currently facing a potential future mismatch between energy production and transformation, an increasing interest is being paid to new techniques to both discover and understand the failure mechanisms, as well as provide lifetime prediction for engineering materials and structures.

Working structures and their elements are subjected to the influence of various loads. These can be static, cyclic, or dynamic loads. In order to ensure an adequate level of safety and optimal durability of structural elements, experimental tests and simulations are required to determine the effect of various factors. Such factors include the effects of notches, voids, and environment. Studies and research outcomes carried out in this field are necessary to guide the development of new and advanced standards for a better selection of materials that meet the requirements of the designers.

This issue aims to provide the data, models, and tools necessary to perform structural integrity and lifetime predictions based on both the multiaxial stress state and mixed mode fatigue crack growth, through the use of advanced mathematical, numerical, and experimental techniques. Therefore, researchers are invited to provide original research and review articles that seek accurate and efficient modeling of failure mechanisms.

The aim of this special issue is also to gather the most recent research achievements on the understanding of the initiation and growth of cracks in structural components made of different metals and composites. The analysis of mixed modes is of particular interest, but studies related to the effect of simple load (pure mode conditions) are also well fitted with the aim and scope of the special issue.

Potential topics include but are not limited to the following:

- Factors influencing the fatigue life and crack initiation in structures as well as lifetime prediction
- Influence of geometric effects (scale, notches, etc.) on the initiation and fatigue growth of crack in metals and composites
- Heat treatment and load frequency effects on the behavior of metals and composites
- Influence of stress ratio on the behavior of structures under fatigue loading (crack growth)
- The influence of mechanical factors on the lifetime of brittle and ductile metals or composites and damage/degradation
- Local and global approach to crack growth in mixed modes
- Structural integrity and fatigue and fracture assessment
- Computer aided fatigue crack growth behavior in complex structures

Authors can submit their manuscripts through the Manuscript Tracking System at <https://mts.hindawi.com/submit/journals/amse/cfcg/>.

Papers are published upon acceptance, regardless of the Special Issue publication date.

Lead Guest Editor

Dariusz Rozumek, Opole University of Technology, Opole, Poland
d.rozumek@po.opole.pl

Guest Editors

Alexander Balitskii, National Academy of Sciences of Ukraine, Lviv, Ukraine
balitski@ipm.lviv.ua

Grzegorz Lesiuk, Wrocław University of Science and Technology, Wrocław, Poland
grzegorz.lesiuk@pwr.edu.pl

Stanislav Seitzl, Institute of Physics of Materials, Brno, Czech Republic
seitzl@ipm.cz

Submission Deadline

Friday, 12 July 2019

Publication Date

November 2019