



*Editorial*

**Special issue on interaction of multiple cracks in materials—Volume 1  
and 2**

**Kunio Hasegawa \***

Consultant, Center of Advanced Innovation Technologies, VSB-Technical University of Ostrava, Ostrava, Czech Republic

\* **Correspondence:** Email: [kunioh@kzh.biglobe.ne.jp](mailto:kunioh@kzh.biglobe.ne.jp).

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**1. Interaction of Multiple Cracks in Materials—Volume 1**

Multiple cracks are often detected in various substances. The cracks in the substances produce unexpected various phenomena caused by interaction of adjacent cracks. In addition, it is complex to analyze the phenomena, compared with a single crack. It is required to assess the cause of the crack formations and understand the morphologies how the multiple cracks affect the quality of the substances.

The Volume 1 of the Special Issue on Interaction of Multiple Cracks in Materials compiles 12 papers with wide range of substances, such as electric elements, chemical sheet and film, hyperelastic materials, rivet sheet and metals under the loading conditions of dynamic, non-homogeneous stress field and tensile stresses. Various advanced characterizations on crack propagation, deformation, dynamic stress intensity factor, hot cracking during fusion welding, failure and fracture instability are merged in the Special Issue. All papers emphasize on the interaction effect of multiple abutting cracks and present very valuable contributions to the wide range of substances.

**2. Interaction of Multiple Cracks in Metallic Components—Volume 2**

The Volume 2 of the Special Issue on Interaction of Multiple Cracks in Metallic Components compiles 11 papers related to engineering approaches of fatigue crack growth behavior, coalescence of the multiple cracks and interaction effects of stress intensity factors. The analyzed cracks are parallel cracks, collinear unequal straight cracks, embedded and surface cracks in pipes, vessels, bars,

and plates under the loading conditions of cyclic and tensile stresses.

Multiple discrete cracks have been often detected in metallic components during fabrication and in-service inspection at industrial plants. These components are required to repair/replace or to allow continuous operation for a certain period by using fracture mechanics analyses. The analyses of the crack evaluations for the components containing multiple cracks are not easy because of the interaction effect by the adjacent cracks. All papers in Volume 2 deal with influence of the interaction by the cracks actively. Majority of the papers will be utilized for improvement of the assessment for fatigue crack growth procedures and the combination rules in terms of fitness-for-service codes and standards.



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