

## **Stress Intensity Factors Analyses of Three-Dimensional Interface Cracks using the Tetrahedral Finite Elements**

Masaki Nagai, Toru Ikeda and Noriyuki Miyazaki

### **Summary**

New method is presented for evaluating the stress intensity factors of a three-dimensional bimaterial interfacial crack using the tetrahedral finite elements. This technique is based upon the M1-integral method and employs the moving least-square approximation. Due to the use of the moving least-square approximation, stress or strain in the M1-integral equation is approximated from the nodal displacements obtained by the finite element analysis. Therefore, the presented method needs to extract no elemental information from the finite element analysis and can calculate the M1-integral independently of the arrangement of finite elements. In this study, stress intensity factors analyses of a penny-shaped interface crack, a semi-circular surface crack and an external circular interface crack using the tetrahedral finite elements are demonstrated.

