

Adaptive meshfree method with adding and moving nodes for calculation of stress intensity factors

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It is noticed that meshfree methods do not need nodes-elements connectivity such as the finite element method. The element free Galerkin (EFG) method is also one of the mesh free methods. It is appropriate for adaptive methods to be able to add and move nodes easily. When nodes are added near the stress concentrated region, they sometimes make the node distribution change from roughness to fineness largely. The nodal relocation after adding nodes is needed to improve the accuracy of the solutions. Both adding nodes and relocating nodes by the physically based simulation are applied to the EFG method. The physical interbubble forces are associated with the calculated posteriori error to move nodes. In this paper, the adaptive EFG method is applied to calculate J-integral to evaluate precision of stress intensity factors of crack problems. J-integrals are calculated in an each node allocation and on an each integral path.

Keywords: meshfree method, element free Galerkin method, adaptive analysis, crack problem.