SM1L_11720

XXI International Congress of Theoretical and Applied Mechanics
Warsaw, Poland, August 15–21, 2004

Some Investigations on FM Bem in Solid Mechanics

Zhenhan Yao, Haitao Wang, Pengbo Wang

Dept. of Engineering Mechanics, Tsinghua University, Beijing, China

As well known, the boundary element methods (BEM) has remarkable advantages of dimension reduction and higher accuracy, but the conventional BEM is not efficient for large scale problems. For the conventional BEM O(N*N*N) operations and O(N*N) memory are required, where N is the number of DOF. Fast multipole (FM) methods presented by mathematicians have reduced the operations and memory requirement to O(N). The FM BEM becomes an attractive way to solve complex practical engineering problems with BEM. In this presentation, a new version algorithm of O(N) FM BEM for 2D elastostatics is presented and applied to the simulation of 2D elastic solid with large number of randomly distributed inclusions. Furthermore, FM BEM is applied to the simulation of 2D elastic solid containing large number of randomly distributed cracks.

View the extended summary