

Models of Corner and Crack Singularity of Linear Elastostatics and their
Numerical Solutions

楊立杰, 李子才, Po-Chun Chu, 李明恭

Applied Statistics

Management

young@chu.edu.tw

Abstract

The singularity solutions for linear elastostatics at corners are essential in both theory and computation. In this paper we seek the singular for corners with the clamped and the free stress boundary conditions, and explore corner singularity in detail. In this paper the singularity solutions of linear elastostatics are derived, and two new methods of interior crack singularity are proposed. The collocation Trefftz methods are used to obtain highly accurate solutions, where the leading coefficient has 14 significant digits by the computation with double precision. Such solutions are useful to examine other numerical methods for singularity problems in linear elastostatics. Also the explicit singular solutions can be adapted to design and develop efficient numerical methods for singularity problems, such as the collocation Trefftz method, the hybrid Trefftz method, and the combined method, such as those with FEM, FDM, and with the method of fundamental solutions.

Keyword : Elastostatics, Corner Singularity, Crack Singularity, Collocation Trefftz Method