

Numerical Construction of Deformation Field Under Wedge Indentation

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Abstract:

The construction of the stress field in the deformation region under a smooth rigid wedge punch is presented. The stress components are assumed to satisfy Mohr-Coulomb yield criteria under plane strain condition. The governing equation for the model is the first order partial differential equation, the stress equilibrium equations. The deformation region is made up of the union of adjacent elementary boundary value problem and solved numerically. The region is constructed by using Matlab and it shows the formation of the lip on the free surface. The result was then compared to analytical solutions. This method is of great interest as it will bring about an increase in efficiency and hence improvement in industrial productivity. The method is also an alternative for the solution of the deformation problems as it is simple and more reliable. This will consequently help in the improvement of the existing tools and experimental facilities in the industries and will eventually increase its efficiency.

Keywords: Stress Equilibrium Equations; Order Partial Differential; Deformation

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