Abstract

Finite Element Analysis is a well known computing technique to numerically solve a range of problems in the day to day life especially in the area of solid or fluid mechanics. Virtual parametric study of mechanical properties of most of the engineering materials can be done in an efficient way if a suitable numerical model representing the material can be incorporated into an FEA package. Fiber reinforced cement composite being a particulate composite of quasi brittle nature, a meso level numerical model may essentially consist of a mortar phase and an aggregate phase. This two phase model may be considered to be the smallest repeating volume of the material and is referred to as the unit cell under consideration. A simulation of compressive loading on this unit cell model is expected to capture the properties of the material as a whole within acceptable limits. In the current paper, a unit cell with a square aggregate volume fraction is considered and the adaptability of the unit cell for a range of aggregate volume fractions is enhanced by using a python script in a semi automatic manner. This script enhanced unit cell can be easily redesigned and may be used for any size and shape of the aggregate volume fraction as required.
References


Index Terms
Keywords
Cement Composites  Quasi Brittle Failure  Unit Cells  Simulation  Compression  Loading  Rve  Fea

Mesoscale Models

 Constitutive Behaviour