

## AN ALGORITHM FOR GENERATE MICRO MECHANICAL MODELS WITH CIRCULAR INCLUSIONS

H.D. Miranda<sup>1</sup>, F.M. Andrade Pires<sup>2</sup> and A.T. Marques<sup>3</sup>

<sup>1</sup> DEMEGI Faculdade de Engenharia da Universidade do Porto, Rua Dr. Roberto Frias, s/n  
4200-465 Porto - Portugal, dem09021@fe.up.pt

<sup>2</sup> DEMEGI Faculdade de Engenharia da Universidade do Porto, Rua Dr. Roberto Frias, s/n  
4200-465 Porto - Portugal, fpires@fe.up.pt

<sup>3</sup> DEMEGI Faculdade de Engenharia da Universidade do Porto, Rua Dr. Roberto Frias, s/n  
4200-465 Porto - Portugal, marques@fe.up.pt

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An algorithm for generate models of representative volume elements (RVE) of the microstructure of materials with huge number of circular inclusions of constant diameter is described. The type of problem that the algorithm aims to solve belongs to the class of sphere packing problems, with important industrial and academic applications. In fact statistical mechanics of hard-sphere systems has generated many interest by the scientific community from Boltzman (1898) [6] to the Bernal (1959)[7] works on the model the structure of liquids using random close packing(RCP), and many more scientists that contributed for this subject.

This way, the general propose algorithm generate models to define the internal structure of unidirectional fibre reinforced composites and other materials, but can also be used for other types of applications. The proposed algorithm has a linear complexitiy and it is based on a new and inovative geometric concept to distribute the inclusions. The computational efficiency of this algorithm was compared with the efficiency of other existing algorithm ([1]) revealing the advantages of the method. The generated models have been used for finite element analysis of materials under periodic boundary conditions and showed transversal isotropy of the material and good agreement with experimental results.

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