TECHNISCHE UNIVERSITÄT DRESDEN

Fakultät Bauingenieurwesen Institut für Massivbau

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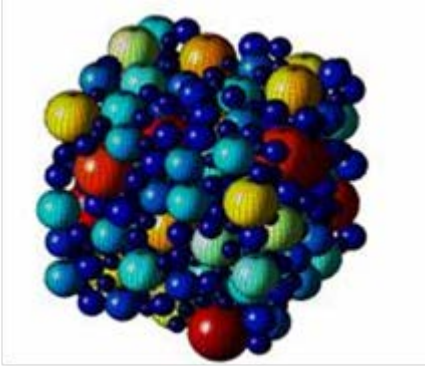
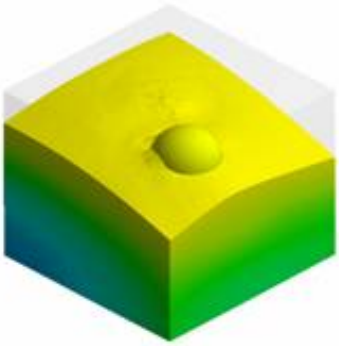
Development of a Finite Element concrete model at mesoscopic scale

For the systematization of the dynamic loading characteristics of different concrete types and their behaviour under different loading conditions, for instance different load direction or loading rate, a finite elemental application needs to be developed at a mesoscopic level, which takes into account the material heterogeneity caused by the concrete aggregates. First, a fully parametric model of the aggregate distribution will be developed on the basis of standard sieve curves, which will be implemented numerically. In the next step, an auto-mated FE-model, taking into consideration the individual aggregates' material properties, will be assembled. Therefore, different types of modelling and meshing methods will be analyzed to determine their individual limits and advantages. Finally, computational parameter studies of the material related to the damage-based anisotropy, strain rate influence, viscosity etc. will be conducted. The goal of the investigations is to discover the influence of in-creasing the heterogeneity of the material during the limited view of a macroscopic formulation in order to determine their magnitude and the interacting behaviour of aggregates and environment matrix and their effects on the homogenized model.





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