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DISCRETE ELASTIC PARAMETERS FOR LATTICE MODEL WITH EMBEDDED DISCONTINUITIES AND APPLICATION IN CONCRETE FRACTURE

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This work presents a lattice fracture model [1-4] with a choice of parameters that lead to correct elastic continuum response. This choice of elastic parameters is important for post peak softening behaviour of the model, where correct stiffness of the model influence fracture propagation. The procedure for the computation of geometric parameters in a lattice fracture model of this type can match the global stiffness correctly [5] and it is applicable in heterogeneous materials under quasi-static regime. Such model can represent fracture and failure mechanisms in concrete and reinforced concrete structures. We show the procedure for choosing the correct elastic parameters which is based on Voronoi domain discretization of points randomly positioned in the domain. Lattice elements are zero-size elements that can match the global stiffness, but it can also be elastically homogeneous for various Poisson coefficients. Numerical examples show the capabilities of the model for simulation of the pre-peak and post-peak behaviour of fracturing in concrete.

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