

A D3Q19 LATTICE-BOLTZMANN PORE-LIST CODE WITH PRESSURE BOUNDARY CONDITIONS FOR PERMEABILITY CALCULATIONS

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Lattice Boltzmann LB simulations are a common tool to numerically estimate the permeability of porous media. For valuable results, the porous structure has to be well resolved resulting in a large computational effort as well as high memory demands. In order to estimate the permeability of realistic samples, it is of importance to develop improvements of the LB method and to implement very efficient codes. We present a comparison between two LB implementations based on pore-matrix and pore-list data structures. Using pore-list data structures instead of the pore-matrix substantially reduces the amount of memory as well as the CPU time required. In addition, often an injection channel is used to drive the fluid through the porous sample, where the fluid is accelerated by a body force. An on-site pressure boundary condition as presented in this work can further reduce the computational effort by reducing the number of lattice sites used.

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