Pore Scale Simulation of Fluid Flow and Heat Transfer in Porous Media

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Abstract. This paper presents an immersed boundary method for the calculation of fluid flow and heat transfer in porous media. A two-dimensional compact finite differences immersed boundary method was used to solve the unsteady, incompressible mass, momentum and energy conservation equations. The temporal and spatial discretizations are preformed, respectively, with a fourth-order Runge-Kutta method and a fourth-order compact scheme, used to achieve highly accurate calculations.