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Lagrangian particle approach for stochastic simulations of flow and transport in porous media

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A new Lagrangian particle model based on smoothed particle hydrodynamics (SPH) was developed and used to simulate Darcy scale flow and transport in porous media. The proposed numerical method has excellent conservation properties and treats advection exactly. The method was applied to stochastic analysis of density driven reactive flows. The presented numerical examples illustrate the advantages of Lagrangian methods for stochastic transport simulations.