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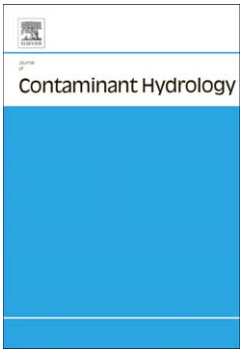

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Smoothed particle hydrodynamics: Applications to migration of radionuclides in confined aqueous systems

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Abstract

A smoothed particle hydrodynamics (SPH) model is presented for simulating the decay chain transport of radionuclides in confined aqueous solutions. The SPH formulation is based on the open-source parallel code DualSPHysics extended to solve the advective-diffusion equation for the evolution of the concentration field coupled to the fluid-dynamic equations, including the effects of radioactive decay of the tracer contaminants. The performance of the method is demonstrated for environmental engineering problems dealing with the transport of contaminants in still and flowing water. The results from a series of benchmark test calculations are described in two- and three-space

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