

# Localization of the pollution source position with a space-time discontinuous Galerkin method for transport in porous media

Christian Wieners<sup>1</sup> Daniele Corallo<sup>2</sup>

We introduce a parallel adaptive space-time discontinuous Galerkin method for the linear transport equation, where the transport vector is determined from the porous media equation. Given the permeability distribution, in the first step the pressure head and the flux is computed by a mixed approximation of the linear porous media problem. Then, for a given initial pollution distribution the linear transport is approximated by an adaptive DG space-time discretization on a truncated space-time cylinder which turns out to be very efficient since the adaptively refined region is transported with the pollution distribution. The full linear system in space and time is solved with a parallel multigrid method where the stopping criterium for the linear solver is controlled by the convergence of a linear goal functional. Finally we apply this method to solve the inverse problem to reconstruct the initial pollution distribution from measurements of the outflow.

## References:

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<sup>1</sup>KIT, Mathematics  
christian.wieners@kit.edu

<sup>2</sup>KIT, Mathematics  
daniele.corallo@kit.edu