LEAST-SQUARES SPACE-TIME FORMULATION FOR
ADVECTION-DIFFUSION PROBLEM WITH
EFFICIENT LINEAR SOLVER BASED ON MATRIX
COMPRESSION

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ABSTRACT

We present a space-time formulation of the non-stationary advection-
dominated advection-diffusion problem based on a constrained least-
squares approach. For discretization we use Isogeometric Analysis
and employ B-spline basis functions. While using standard separate
time and space discretization, in some restricted cases it is possible
to construct highly efficient linear solvers exploiting the structure of
the problem and the time stepping schemes (e.g. [1]), with space-time
formulation the resulting matrix has a more complex structure. We
present the idea of an iterative solver employing a matrix compression
technique based on recursive decomposition and singular value decom-
position (SVD).

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