

Anisotropic goal oriented space time adaptivity applied to convection diffusion reaction equation

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We present an anisotropic, goal-oriented error estimator based on the Dual Weighted Residual (DWR) method for time-dependent convection-diffusion-reaction equations. By leveraging anisotropic interpolation, the estimator decomposes directional contributions to the error, naturally guiding adaptive mesh refinement in space and time. Stabilization via the SUPG method ensures robustness for high Péclet numbers. Numerical results highlight the efficiency of our method in resolving sharp layers and demonstrate clear advantages over isotropic and globally refined meshes for convection-dominated transport benchmarks.

References:

[1] <https://arxiv.org/abs/2504.04951>

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