On Finite Element Methods for transient convection–diffusion–reaction equations

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The solution of transient convection–diffusion–reaction equations is part of many numerical simulations in applications. Often, not only the accuracy of solutions is of importance, e.g. the sharpness of layers, but also the smallness of spurious oscillations is essential.

The talk presents numerical studies of different finite element approaches for solving linear scalar transient convection–diffusion–reaction equations. These approaches include

- the SUPG method,

- various SOLD methods,

- FEM flux corrected transport schemes,

- local projection schemes.

The numerical results will be assessed with respect to both criteria mentioned above.