Talk announcement

Christian Koethe
(RICAM)

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Adaptive least-squares space-time finite element methods

In this talk we consider a minimal residual approach for the solution of parabolic evolution equations in combination with a fully unstructured space-time discretization scheme.

Firstly, we discuss the minimal residual method on an abstract level including a complete stability and a priori error analysis. Moreover, we show that the method obtains an inbuilt error estimator which can be used to drive an adaptive refinement scheme.

Secondly, we consider different PDEs including the heat equation, the convection-diffusion equation and the eddy current approximation of the Maxwell system. Numerical examples will be presented which confirm our theoretical findings and the inbuilt error estimator will be used in an adaptive refinement scheme resulting in meshes which are completely unstructured with respect to space and time.

Finally, we will conclude with some remarks on future work in this area which needs to be done.