SPACE-TIME FINITE ELEMENT METHODS FOR PARABOLIC EVOLUTION EQUATIONS

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ABSTRACT

In this talk we will discuss the space-time variational formulation of parabolic evolution equations in Bochner spaces and its space-time finite element discretization. In addition to completely unstructured simplicial space-time finite element meshes as considered in [2] we will also consider space-time tensor product meshes and we will discuss related error estimates. In addition to the standard formulation we will also consider a least-squares formulation for which we derive stability and error estimates. The latter is strongly related to a distributed optimal control problem with a regularization in the energy norm [1].

References

[1] U. Langer, O. Steinbach, F. Tröltzsch, H. Yang. *S*pace-time finite element discretization of parabolic optimal control problems with energy regularization, SIAM J. Numer. Anal. 59 (2021), 675–695.

[2] O. Steinbach. *Space-time finite element methods for parabolic problems*, Comput. Methods Appl. Math. 15 (2015), 551–566.

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