"Some aspects of high order discretizations of parabolic PDEs with splitting methods"

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Abstract.
We deal with the full discretization of multidimensional parabolic PDEs by following the MoL approach, but introducing two particular aspects. First, a fourth order space discretization with central finite differences with low computational costs, in place of the usual second order space discretizations considered in practice, and secondly a high order time integration method of splitting type (AMF-W method) to complete the full discretization and to maintain the computations at reasonable levels of time.
We discuss aspects of the convergence orders of the space discretizations for arbitrary space dimensions, the convergence orders in the PDE sense of the splitting methods for the time integrations and the convergence orders of the whole approach. We also consider some boundary corrections to avoid the order reduction in case of time dependent boundary corrections.