Technische Universität Dresden

tu-dresden.de/mathematik

Sommersemester 2026

Dresdner Mathematisches Seminar

Prof. Dr. Alexandre Ern
CERMICS, ENPC (Ecole nationale des ponts et chaussées), IP Paris

Convergence of ERK-DG approximations of the first-order form of Maxwell's equations with low regularity

We establish a convergence result for the approximation of low-regularity solutions to time-dependent PDE systems that have an involution structure similar to Maxwell's equations and the linear wave equations. The approximation is based on an explicit Runge--Kutta (ERK) time-stepping and the discontinuous Galerkin (dG) method with stabilization (so-called upwind fluxes) in space. The regularity setting only assumes in space a Sobolev regularity index s in $(0,\frac12)$. The two main tools for the convergence analysis are a Ritz projection in space that leverages recent convergence results in operator norm for the dG approximation of the steady form of the PDE, and some relatively novel results on the L^2-stability in operator norm under a standard CFL condition of three-stage, third-order and four-stage, fourth-order ERK schemes. This is joint work with J.-L. Guermond (Texas A&M).

Mittwoch, 03.06.2026, 17:00 Uhr – Willers-Bau, Raum A 124

Leitung: Prof. Dr. Dirk Pauly

Vor dem Vortrag findet **ab 16:30 Uhr** ein gemeinsames **Kaffee-/ Teetrinken** vor dem Vortragsraum WIL A 124 statt.

Stand: 22.04.2026

Bereich Mathematik und Naturwissenschaften
Fakultät Mathematik