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Talk announcement

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Discontinuous Galerkin method for time-domain Maxwells equations in anisotropic materials

In this talk, we present a fully explicit leap-frog type discontinuous Galerkin method for the numerical discretization of the time-dependent Maxwells equations. In our model, we consider anisotropic dielectric permittivity which arise naturally in our application of interest. We provide the proof of stability and convergence of the scheme taking into account typical boundary conditions, either perfect electric, perfect magnetic or first order Silver- Muller absorbing boundary conditions. The bounds of the stability region point out not only the influence of the mesh size but also the dependence on the choice of the numerical flux and the degree of the polynomials used in the construction of the finite element space, making possible to balance accuracy and computational efficiency. We illustrate the stability and convergence properties of the scheme with numerical tests. Furthermore, the simulation of light scattering in a two-dimensional domain which aims to represent a simple example of light scattering in retina is presented.