

Title: On some parallel linear algebra tools for wave propagation simulations

In this talk we will present recent progresses on numerical linear algebra sparse solvers for large scale calculations.

The first one is related to the parallel solution of large sparse linear systems using algebraic domain decomposition ideas. Its parallel implementations enable to naturally exploit two levels of parallelism (MPI-threads) that match nicely the hierarchical structure of emerging parallel platforms.

The second part of the presentation will be devoted to a new block Krylov solver able to solve linear systems with multiple right-hand sides, e.g., SER calculations. This solver exploits both partial deflation in the Krylov subspace expansion when partial convergence takes place and spectral augmentation at restart.

Numerical experiments and scalability performances will be reported for simulations in the frequency domain for both Maxwell and electrodynamic simulations conducted in collaboration with the Inria Magique3D and Nachos teams