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A MULTISCALE HYBRID-MIXED METHOD FOR THE MAXWELL EQUATIONS IN TIME DOMAIN

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This work proposes a Multiscale Hybrid-Mixed (MHM) method for the Maxwell equation in time domain. The MHM method is a consequence of a hybridization procedure, and emerges as a method that naturally incorporates multiple scales while provides solutions with high-order precision. The computation of local problems is embedded in the upscaling procedure, which are completely independent and thus may be naturally obtained using parallel computation facilities. In this talk, we present the new MHM method for the two-dimensional Maxwell equations in time domain (Transverse Magnetic mode). We address some theoretical aspects of the method and propose an extensive numerical validation. We conclude that the MHM method is naturally shaped to be used in parallel computing environments and appears to be a highly competitive option to handle realistic multiscale hyperbolic boundary value problems with precision on coarse meshes.

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