Evaluation of Shielding Effectiveness in the Time Domain using a DG Method with an Efficient PML

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Development of new electric and electronic devices leads to an increasing importance for solving electromagnetic compatibility problems. In particular, the optimization of radiated emissions is increasingly done through numerical modeling. In this context, numerical methods allow to evaluate the effectiveness of more and more elaborate shielding enclosures.

We propose an application of the nodal Discontinuous Galerkin method to evaluate the effectiveness of composite shieldings in the time domain. This numerical method provides convenient advantages to deal with shielding problems. Firstly, heterogeneous media are naturally included in the discrete formulation. After, the method is famous to allow a massive parallelization for the numerical resolution. Finally, a resolution in the time domain allows to consider transient signals.

The numerical scheme is firstly validated using an academic benchmark. In the same way, the PML used to truncate the computational domain is optimized and validated. Applications are then presented for homogeneous and composite shieldings. The preliminary results are in conformity with classical predictive rules.