

Title: Two-level DDM preconditioners for Low Frequency Maxwell equations

Abstract: Time discretised Maxwell equations also called positive Maxwell's equations present different challenges from the solution methods point of view. For this kind of problem, where the underlying operator has an infinite dimensional kernel, Hiptmair and Xu have introduced the auxiliary space preconditioner. By exploiting the idea of subspace decomposition together with spectral methods of GenEO type, we introduce here a new generation of preconditioners, capable of tackling heterogeneous problems. However, the coarse space generated in this way, proves to be too large and we propose different filtering strategies in order to reduce the inherent dimension of the coarse space. We explore numerically these new two-level preconditioners on well-chosen test cases.