

UPML Method for Time-Harmonic Scattering Problems in Layered Media

Z. Chen¹ and W. Zheng²

Abstract: In this talk, we propose a uniaxial perfectly matched layer (UPML) technique for solving the time-harmonic scattering problems in two-layer media. The exterior region of the scatterer is divided into two half spaces by an infinite plane, on two sides of which the wave number takes different values. We surround the computational domain where the scattering field is desired by a layer of fictitious medium such that the wave of any frequency entering this medium decays exponentially. By imposing homogenous boundary condition on the outer boundary of the PML layer, we have proved that the solution of the PML problem converges exponentially to the solution of the original scattering problem in the computational domain as the thickness of the layer tends to infinity. Some numerical experiments will also be presented in this talk.

^{1,2} LSEC, Institute of Computational Mathematics
Academy of Mathematics and System Sciences, Chinese Academy of Sciences
Beijing 100080, China
zmchen@lsec.cc.ac.cn, zwy@lsec.cc.ac.cn