

# Perfectly matched layer method for electromagnetic scattering problems in layered media

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This talk is to study the convergence of the perfectly matched layer (PML) method for electromagnetic scattering problems in layered media. The PML method is widely used in the engineering literature and very efficient to solve wave scattering problems. In 2010, Chen and Zheng first proved the exponential convergence of PML method for the Helmholtz scattering problem in a two-layered medium. Since the background materials in the upper and lower half spaces are different, the Green function of the scattering problem in layered media becomes very complicated. Their proof is very technical and depends on elaborates estimates for the Green function. In this work, we develop a new framework for the exponential convergence of the PML method and for the well-posedness of the approximate problem. The methodology is used to three-dimensional electromagnetic scattering problems in two-layer media.