
The Adaptive PML Method for Acoustic Wave Scattering Problems

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We report our recent efforts in developing the adaptive PML method for solving the acoustic wave scattering problems. The method uses the a posteriori error estimate to determine the PML parameters such as the thickness of the layer and the artificial medium property. Combined with the adaptive finite element method, the adaptive PML method provides a complete numerical strategy to solve the scattering problems in the framework of finite element which produces automatically a coarse mesh size away from the fixed domain and thus makes the total computational costs insensitive to the thickness of the PML absorbing layer. We will consider the adaptive uniaxial PML method for the Helmholtz scattering problems and the convergence of the time-domain PML method for the wave equations.