工程与应用

带矢量ABC底面的共形完全匹配层

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摘要　　共形完全匹配层是一种有耗各向异性媒质组成的凸且光滑的壳体，其底面一般是PEC面或PMC面，但是PEC面或PMC面会对原散射场产生反射；为了减少底面反射，将CPML原有的PEC（或PMC）底面改为矢量ABC吸收边界，并给出了带矢量ABC底面的CPML泛函公式。通过数值算例证明，这种带矢量ABC底面的CPML边界不仅减少了底面反射，而且吸收效果好，计算精度高。

关键词　　共形完全匹配层　矢量ABC吸收边界　电磁散射计算

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Conformal PML backed by vector absorbing boundary condition

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Abstract

　Perfectly Matched Layers（PML） are the layers of electromagnetic wave absorbing elements designed for the mesh truncation of an open domain in a harmonic or modal analysis.It is an artificial anisotropic material that is transparent and heavily lossy to incoming electromagnetic waves.Conformal PML（CPML） is a convex and smooth shell region made up of lossy anisotropic medium.Generally，a CPML region is backed by a PEC boundary condition or a PMC boundary condition.But there are some reflections back into the computational domain by the PEC（PMC） boundary condition.In order to reduce the reflections，the PEC（PMC） boundary condition is changed into vector Absorbing Boundary Condition（ABC），and functional formula of CPML backed by vector ABC is deduced.Numerical examples show that CPML backed by vector ABC is of high-precision and high-efficiency.

Key words　conformal Perfectly Matched Layers（PML）　vector absorbing boundary condition electromagnetic scattering computation

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