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Isogeometric Analysis of Acoustic Scattering with Perfectly Matched Layers

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The perfectly matched layer (PML) [1] formulation is a prominent way of handling radiation problems in unbounded domain and has gained interest due to its simple implementation in finite element codes. However, its simplicity can be advanced further using the isogeometric framework [2]. We will present a spline based PML formulation which avoids additional coordinate transformation as the formulation is based on the same space in which the numerical solution is sought. The procedure can be automated for any convex artificial boundary. This removes restrictions on the domain construction using PML and can therefore reduce computational cost and improve mesh quality. The usage of spline basis functions with higher continuity also improves the accuracy of the numerical solution.

In addition to studying different stretching functions and other parameters in the PML formulation, we will present results for more complex geometries [3] compared to previous work [4]. A discussion around the motivation for using the PML formulation over other formulations like the infinite element method and the boundary element method will also be presented.

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