

MASTER'S THESIS

A domain decomposition method for some partial differential equations with singularities

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A Domain Decomposition Method for
some Partial Differential Equations with Singularities

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Abstract

In solving elliptic partial differential equations, the solutions are often involved in singularities. Many physical phenomena can be described as elliptic boundary value problems with singularities. For instance, solutions of the domain composed with two different materials may cause singular points in the interface of two materials.

A domain decomposition method with overlapping domain is considered. Applying this method in the partial differential equations with singularities, solutions can be obtained within a few iterations. The convergence of this method is shown. Moreover, numerical examples show the effectiveness of this method.

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