

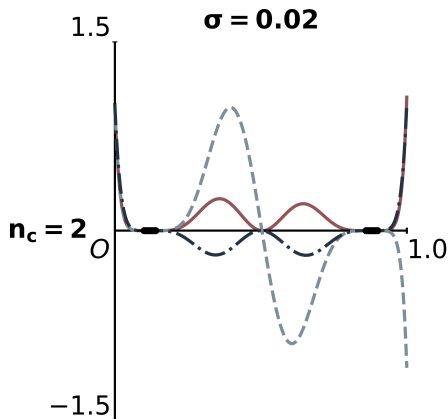
Sharpened CG Iteration Bound for Schwarz-preconditioned High-contrast Heterogeneous Scalar Elliptic PDEs

Going Beyond Condition Number

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Opening

Darcy Problem

Opening

Conjugate Gradient Method

Opening

Condition Number

Opening

Preconditioners

Opening

Research Gap

Structure

- Research Questions
- Mathematical Background
- Related Work
- Preliminary Results
- Outlook

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Research Questions

Main Research Question

- How can we sharpen the CG iteration bound for Schwarz-preconditioned high-contrast heterogeneous scalar elliptic PDEs?

Structure

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Mathematical Background

Conjugate gradient method

Mathematical Background

Schwarz preconditioners

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Related Work

Tailored Coarse Spaces for High-Contrast Problems

Related Work

CG convergence in case of non-uniform spectra

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Preliminary Results

Two-cluster case

Preliminary Results

Generalization to multiple clusters

Preliminary Results

Numerical example

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Outlook

Research Question 1 answered

Outlook

Research question 3 answered

Outlook

Next steps

- Work on answering research questions 4, 5, and 6.

Outlook

Open Challenge

- How to answer research question 2?