



Faculty of Mathematical Sciences, Department of Applied Mathematics

An Overlapping Domain Decomposition for Optimal Control Problems

By:

Mehdi Zallaghi

Tuesday, 4 February 2020

Outline

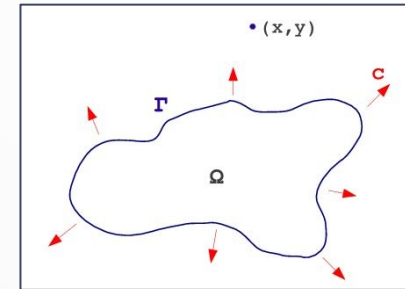
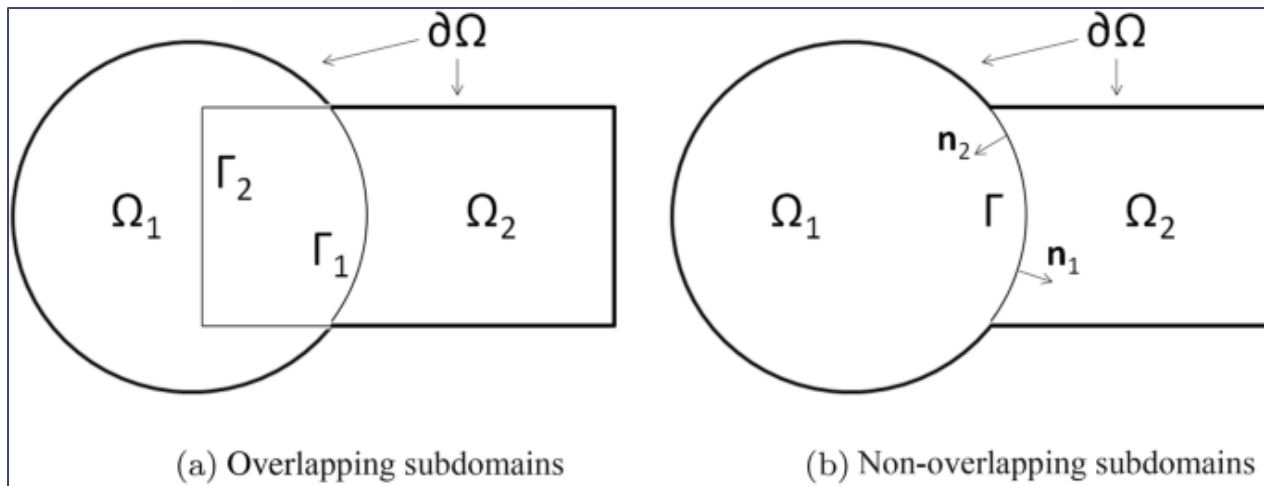
- Introduction
- Domain Decomposition Methods
- Overlapping Domain Decomposition
- Domain Decomposition as a Preconditioner
- Optimal Control Problems
- DDM for Optimal Control Problems
- Numerical example

Introduction

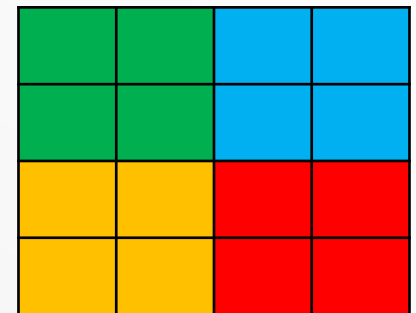
Domain decomposition methods

Domain Decomposition: Divide a spatial domain into smaller domains (subdomains)

- **overlapping methods:** the subdomains overlap by more than the interface
- **non-overlapping methods:** the subdomains intersect only on their interface



Computational Domain

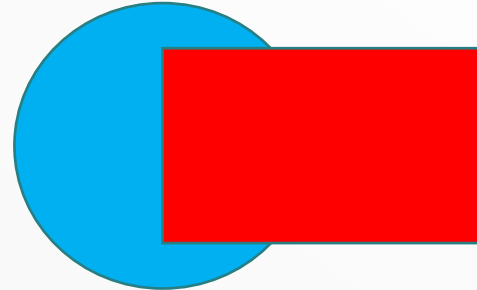


Introduction

Overlapping Domain decomposition methods

Overlapping Domain Decomposition Methods

- Schwarz alternating method
- Additive Schwarz method



A continuous problem on a region is discretized into a finite problem on a discrete domain

- 1) splitting the computational domain into smaller subdomains
- 2) solving in parallel the subproblems defined in subdomains
- 3) along with exchanging solution information between adjacent subdomains



THANK YOU
