

The Second Workshop on Recent Progress of the Scaled Boundary Finite Element Method (SBFEM2018)

Faculty of Infrastructure Engineering, Dalian University of Technology, Dalian, China

Nov. 3-5, 2018



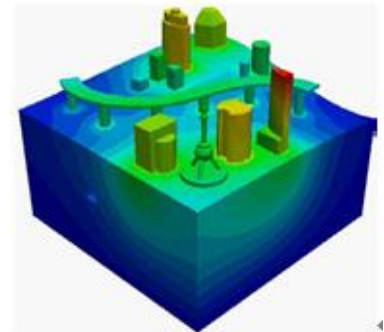
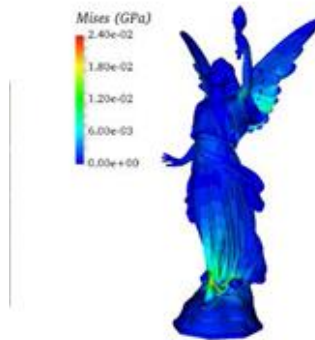
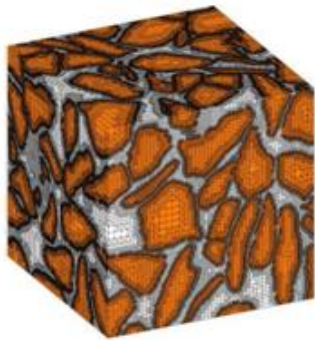
INTRODUCTION

Objectives

The scaled boundary finite element method (SBFEM) has been developed into a general purpose numerical method since it was first proposed by Song and Wolf in 1996 for the solution of wave propagation problems. This method is semi-analytical and only the boundaries of the subdomains are discretized. Its advantages were firstly recognized for the modelling of problems involving unbounded media and singularities. Recently, a methodology for constructing arbitrary polygon/polyhedron elements for linear and nonlinear analyses was established based on the SBFEM. This development theoretically renders the range of application of the SBFEM as wide as that of the displacement-based finite element method. Today, the application of the SBFEM has been expanded to many other important fields in engineering, such as fluid mechanics, dam-reservoir-foundation interaction, electromagnetics, ultrasonic guided waves problem, fracture problem, acoustics, seepage, electrostatics, linear and nonlinear geotechnical problems, sensitivity analysis and heat transfer, etc. However, great potential of the SBFEM in modelling 3D microstructures of concrete or composite materials, crack propagation, dynamic contact for cracks analysis, shell problems, dam-reservoir-foundation interaction, interaction of complex soil and pile foundation, large scale computing problem, fast mesh generation problem, moving boundary problems, etc. remains to be explored.

In order to summarize new developments, advances and applications of the scaled boundary finite element method and provide a floor for the mutual exchange of ideas on the SBFEM for the interested research all over the world, The First Workshop on Recent Progress of the Scaled Boundary Finite Element Method (SBFEM2017) has been

successfully held in Hohai University, Nanjing on Nov. 5-7, 2017, the second workshop (SBFEM2018) continuing the previous and successful workshop will be held in Dalian University of Technology on Nov. 3-5, 2018.



Conference Topics

Over the years, research has refined the initial version of the method and one can identify the following salient topics under particularly intensive study:

- Solid and fracture mechanics
- Infinite domain problems
- Fluid-structure interaction
- Dam-reservoir-foundation interaction
- Heat transfer
- Shell structure analysis
- Combined experimental and numerical SBFEM methodologies
- Computer implementation aspects.

Short Course

Fundamental and MATLAB Implementation of the Scaled Boundary Finite Element Method, presented by Prof. Chongmin Song, University of New South Wales, Australia.

COMMITEES

Conference Chairmen

- Prof. Gao Lin (Chairman), *Dalian University of Technology, China*
- Prof. Chongmin Song (Co-chairman), *University of New South Wales, Australia*

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- Prof. Gao Lin, *Dalian University of Technology, China.*
- Prof. Haitian Yang, *Dalian University of Technology, China.*

- Prof. Degao Zou, *Dalian University of Technology, China.*
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- Prof. Zhenjun Yang, *Zhejiang University, China.*
- Prof. Shenshen Chen, *East China Jiaotong University, China.*
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- Dr. Peng Zhang, *Hohai University, China.*
- Dr. Zejun Han, *South China University of Technology, China.*
- Dr. Lin Pang, *China Railway Eryuan Engineering Group Co. LTD, China.*

Conference Secretariat

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DATES AND FEES

Dates

Deadline for submitting abstract	September 30, 2018
Notification of acceptance of abstracts	October 15, 2018
Conference	November 3-4, 2018
SBFEM course for students and young teachers	November 5, 2018

Fees

Regular Fee: 800 RMB

Student Fee: 400 RMB

Registration fees will include: Program, morning and afternoon coffee breaks, lunch, supper.

Conference Venue

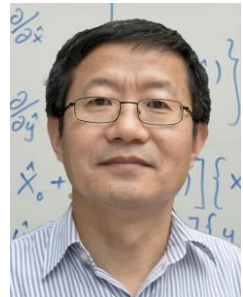
Dalian University of Technology

No.2 Linggong Road, Ganjingzi District, Dalian City, Liaoning Province, P.R.China, 116024

SHORT COURSE

Date & Time: November 5, 2018, 9:00~12:00, 14:30~17:30

Speaker: Prof. Chongmin Song (University of New South Wales)



This short course will present the fundamental theory and MATLAB implementation of the scaled boundary finite element method (SBFEM) in the context of a generally applicable numerical method. The contents of this course are selected from Song (2018) “*The Scaled Boundary Finite Element Method: Introduction to Theory and Implementation*” Wiley, and include:

1. Basic formulations of the scaled boundary finite element method in two dimensions: scaled boundary coordinates and transformation, derivation of the scaled boundary finite element equation by virtual work principle, and element coefficient matrices
2. Solution of the scaled boundary finite element equation by eigenvalue decomposition: element stiffness, strain and stress field, and mass matrix.
3. Platypus – a MATLAB program for 2D linear static and dynamic analysis using the scaled boundary finite element method
4. Automatic polygon mesh generation.
5. Modelling considerations in the scaled boundary finite element method.

To fully benefit from the course, it is advisable to bring your own laptop with MATLAB installed.