THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

DEPARTMENT OF APPLIED MATHEMATICS
應 用 數 學 系

# The Hong Kong Polytechnic University
# Department of Applied Mathematics

## Colloquium

## BEM-FEM, implicit-explicit coupling for the wave equation in the second order formulation


**By**

**Prof. Lehel Banjai**
**Heriot-Watt University**



## Abstract

We consider acoustic scattering of waves by bounded inhomogeneities in an unbounded homogeneous domain. We make use of a symmetric FEM/BEM formulation. The solution in the interior is discretized in space by a finite element method. In the unbounded outer domain, the solution is represented by layer potentials and discretized on the boundary by the boundary element method. In time we discretize the boundary integral operators by convolution quadrature based on an A-stable linear multistep method, whereas the interior equation is discretized by leapfrog under a CFL condition. We give a stability and convergence analysis and illustrate the method with numerical experiments.


### Bibliography

Prof. Lehel Banjai received his PhD degree from University of Oxford in 2003. He also obtained 2013 Habilitation at the University of Dusseldorf, Germany. He joined Heriot-Watt University in 2012 and is now Associate Professor in Mathematics at Heriot-Watt University. Prof. Banjai's research interest is numerical analysis and scientific computing. He has worked on many different research directions, including time-domain boundary integral equations, parallel algorithms for evolution equations, discontinuous Galerkin method, frequency domain wave propagation, eigenvalue computations, and computational complex analysis.

**Date: 28 May 2021 (Friday)**
**Time: 16:00-17:00 (Hong Kong Standard Time GMT +8)**
**Venue: Online Talk via Zoom (Meeting ID: 987 8780 8504)**
**Speaker: Prof. Lehel Banjai, Heriot-Watt University**
**Host: Dr. Buyang Li, The Hong Kong Polytechnic University**
**Click to join:**
https://polyu.zoom.us/j/98787808504?pwd=ZWtaMWhBOWtaSUVIL1JRclJyQUpUZz09

Click to join (Zoom)

*** * * ALL ARE WELCOME * * ***

For enrolment, please send your name and email to shuk-wai.ko@polyu.edu.hk on or before 27 May 2021