

MS 11: Domain Decomposition preconditioners and solvers for Isogeometric Analysis and Virtual Element Methods

Luca Pavarino
Università degli Studi di Pavia, Italy
luca.pavarino@unipv.it

Stefan Takacs
Johannes Kepler University Linz, Austria
stefan.takacs@numa.uni-linz.ac.at

Olof Widlund
Courant Institute of Mathematical Sciences, New York University, US
widlund@cims.nyu.edu

Abstract

This minisymposium will focus on the latest research developments in Domain Decomposition Methods for Isogeometric Analysis (IGA), and Virtual Element Methods (VEM), two recent innovative numerical frameworks for the discretization of Partial Differential Equations (PDEs). The goal of IGA is to better integrate Finite Element analysis and Computer Aided Design (CAD) by employing splines and NURBs basis functions in a Galerkin or collocation scheme. VEM is a generalization of finite elements to polyhedral meshes and some of these methods also resemble finite volume schemes. The VEM algorithms are now very well supported by theory and work has now started to develop and analyse DD algorithms. The design and analysis of efficient domain decomposition and related solvers for the discrete systems arising from these innovative techniques present new theoretical and numerical challenges. The minisymposium is not restricted to the presentation of domain decomposition solvers themselves, novel or non-standard discretization techniques might be presented in order to stimulate the work on related domain decomposition solvers. The goal of this minisymposium is to bring together researchers working in these fields to advance the design, analysis and parallel implementation of novel domain decomposition preconditioners and scalable solvers.

First session

Olof Widlund
Courant Institute of Mathematical Sciences, New York University, US
widlund@cims.nyu.edu

Jarle Sogn
Department of Mathematics, University of Oslo, Norway
jarlesog@math.uio.no

Stefan Takacs
Institute of Numerical Mathematics, Johannes Kepler University Linz, Austria
stefan.takacs@numa.uni-linz.ac.at

Michał Bosy
School of Computer Science and Mathematics, Kingston University London, UK
m.bosy@kingston.ac.uk

Second session

Stefan Tyoler
RICAM, Austrian Academy of Sciences, Linz, Austria
stefan.tyoler@ricam.oeaw.ac.at

Adam Wasiak
Department of Mathematics and Computer Science, University of Cologne, Germany
adam.wasiak@uni-koeln.de

Juan Calvo
Escuela de Matemática, CIMPA, Universidad de Costa Rica
juan.calvo@ucr.ac.cr

Martina Busetto
Department of Mathematics, Politecnico di Torino
martina.busetto@polito.it

Third session

Thomas Takacs
RICAM, Austrian Academy of Sciences, Linz, Austria
thomas.takacs@ricam.oeaw.ac.at

Melina Merkel
Computational Electromagnetics Group, Technische Universität Darmstadt, Germany
melina.merkel@tu-darmstadt.de

Rainer Schneckenleitner
Electrical Engineering Unit, Tampere University, Finland
rainer.schneckenleitner@tuni.fi