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STRUCTURE PRESERVING AND ADAPTIVE POLYTOPAL METHODS

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ABSTRACT

Polygonal and polyhedral (polytopal, for short) methods for the approximate solution of partial differential equations received a booming attention over the last decade. In this minisymposium, we aim at gathering researchers in the field who are interested in some specific features of such methods: the construction of structure preserving schemes for the approximate solution of multiphysics problems, and the analysis and design of adaptive algorithms as well as of efficient solvers.

On the one hand, adaptivity in polytopal methods automatically allows for hanging nodes and nonmatching interfaces, whereas agglomeration can be successfully exploited in designing efficient solvers. On the other hand, the use of polytopal elements simplifies the meshing when dealing with multiphysics and multiscale problems in presence of complicated data.

Eventually, some relevant properties of solutions to certain partial differential equations have been incorporated in discrete polytopal spaces, e.g., by means of Trefftz and divergence free spaces, and discrete de Rham complexes.

The goal of this mini-symposium is to bring together leading researchers that have contributed to these different aspects of the development and application of polytopal methods and promote exchanges between them.