

RECENT ADVANCES IN POLYTOPAL ELEMENT METHODS, FROM THEORY TO APPLICATIONS

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ABSTRACT

The numerical approximation of Partial Differential Equations on polygonal and polyhedral meshes has been gaining growing interest within the scientific community. Polytopal grids provide a flexible and efficient framework for dealing with challenges such as hanging nodes, diverse cell shapes within a single mesh, and nonmatching interfaces. This versatility makes them particularly suitable for solving problems involving complex inclusions (as in geophysical modeling) or intricate and potentially deformable geometries, such as those found in basin and reservoir simulations, fluid-structure interaction, crack propagation, and contact phenomena. Over the past few years, numerous discretization techniques, such as the Virtual Element Method, the Hybrid High Order method, and the Discontinuous Galerkin method, tailored for polygonal and polyhedral meshes have emerged, revealing strong interconnections. This mini-symposium aims to gather both experienced experts and early-career researchers to exchange recent advances and to foster a shared understanding and collaborative direction in the field.