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NUMERICAL METHODS FOR PDEs AND INTEGRAL EQUATIONS IN ENGINEERING SIMULATIONS: PERSPECTIVES FROM YOUNG RESEARCHERS

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ABSTRACT

This minisymposium aims to bring together researchers working on the numerical analysis and computational treatment of partial differential equations (PDEs) and integral equations, with particular emphasis on the discretization and integration challenges that arise in engineering simulations. The session intends to provide a forum for the discussion of both theoretical advances and computational strategies, fostering exchange between methodological developments and their application to real world problems.

Contributions are welcome on a broad spectrum of topics, including but not limited to:
novel quadrature schemes, such as adaptive refinement strategies and approaches based on unstructured node distributions inspired by meshless methods; accurate and efficient algorithms for the discretization of integral operators; and discretization techniques including the Boundary Element Method (BEM), the Finite Element Method (FEM), the Virtual Element Method (VEM), and their mutual coupling [1,2]. Particular attention will be devoted to applications spanning wave propagation, fluid dynamics, elastodynamics, imaging, ecology, epidemiology, and inverse problems, as well as to industrial and engineering contexts such as aerospace, naval and offshore engineering, civil and structural engineering, automotive systems, and energy technologies.

Consistent with the spirit of the session, proposals demonstrating the interplay between rigorous numerical methodology and practical, industry-relevant challenges are particularly encouraged, in order to strengthen the dialogue between academic research, industrial practice, and public stakeholders. The minisymposium further aims to serve as an inclusive and stimulating venue for PhD students and early-career researchers, offering them the opportunity to present recent results, receive constructive feedback, and establish connections within the broader computational and numerical methods community.

REFERENCES

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[2] Steinbach, O. *Numerical Approximation Methods for Elliptic Boundary Value Problems: Finite and Boundary Elements*. Texts in Applied Mathematics. Springer, New York, 2008.