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Numerical simulations of flows in porous media

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Fluid flows in porous media are common to a wide range of physical and industrial applications, from subsurface flows and waste storage to soft tissues and hydrogels. Understanding and modelling these flows is essential to tackle crucial challenges, such as climate change mitigation (carbon dioxide sequestration, hydrogen storage, fuel cells and energy storage), biological applications (poromechanics, swelling and shrinking porous media) and industrial processes (paper, textiles, construction materials). Porous media flows are primarily governed by multi-physics processes taking place over multi-scale domains. The inherent complexities and the multi-scale nature of the processes make reliable evaluations a challenging task, and experimental and field results, typically expensive and risky, may not be sufficient to provide a complete picture of the flow behaviour. However, recent advances in numerical methods and computational tools enable us to examine the background behavior of these processes and to provide a thorough description of the flow dynamics in porous media. This minisymposium aims to connect researchers actively developing and employing numerical methods for flows in porous media and spark dialogues, cooperations, and new ideas. Topics of interest include, but are not limited to:

- Convection and dispersion
- Pore-scale and Darcy-scale simulations
- Poromechanics
- Filters, foams and membranes
- Biofilms

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