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Type: Oral Presentation

The Darcy-type boundary condition on a porous wall

Thursday, 25 May 2023 14:00 (15 minutes)

The aim of this talk is to present the derivation of the new effective boundary condition for the fluid flow in a domain with porous boundary. We start from the Stokes system in a domain with an array of small holes on the boundary and on each hole we impose an appropriate dynamic condition, namely the value of the normal stress corresponding to the exterior conditions. The goal is to obtain the effective model by studying the convergence of the homogenization procedure, as the period of the porous boundary tends to zero. As a result of our analysis, we propose the interface condition in the form of the generalized Darcy law. If no further assumptions are made concerning the isotropy of the geometry of the porous boundary, the obtained result generalizes the Beavers-Joseph condition. In the second part of the talk, we shall also study the roughness-induced effects on the proposed Darcy-type boundary condition.

Participation

In-Person

References

E. Marušić-Paloka, I. Pažanin, The effective boundary condition on a porous wall, *International Journal of Engineering Science* 173 (2022), 103638, pp. 1-12.

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Primary authors: Prof. PAŽANIN, Igor (Department of Mathematics, Faculty of Science, University of Zagreb, Croatia); Prof. MARUŠIĆ-PALOKA, Eduard (Department of Mathematics, Faculty of Science, University of Zagreb, Croatia)

Presenter: Prof. PAŽANIN, Igor (Department of Mathematics, Faculty of Science, University of Zagreb, Croatia)

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