

Derivation and justification of the effective boundary condition on a porous boundary

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Abstract We derive the new effective boundary condition for the fluid flow in domain with porous boundary. Starting from the Newtonian fluid flow through a domain with an array of small holes on the boundary, using the homogenization and the boundary layers, we find an effective law in the form of generalized Darcy law. If the pores geometry is isotropic, then the condition splits in Beavers–Joseph type condition for the tangential flow and the standard Darcy condition for the normal flow.

The result is compared with the corresponding scalar case.

References

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