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*A new approach for simulating flow through porous immersed boundaries*

Porous, deformable boundaries are encountered in a wide range of applications including cell membranes, vesicles, porous wave makers, and parachutes. The *immersed boundary method* has already proven to be a versatile and robust approach for simulating the interaction of an impermeable, elastic structure with an incompressible fluid flow. We show how to extend the method to handle porous boundaries by incorporating an explicit porous slip velocity through use of Darcy's law.

We derive a simple, radially-symmetric exact solution, which is then used to validate numerical simulations of porous membranes in two dimensions.