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Florian Maris* (florinmaris@wpi.edu), Department of Mathematical Sciences, 100 Institute Rd., Worcester, MA 01609. *Stochastic homogenization for permeable membranes.*

The problem of effective boundary conditions for the flow of a viscous fluid across a type of permeable membrane is considered. The membrane is periodically perforated, with randomly shaped and sized holes, and on the solid part threshold leak conditions are considered: the normal velocity is zero unless the jump in the normal stress across the membrane reaches a yield. The effective conditions are of subgradient type with an effective yield limit, in the case of a densely distributed solid part, or of Navier type, in the case of dilute solid part; in the intermediate case the tangential slip cancels, whereas the normal velocity and stress are continuous. Unlike in the case of perforated walls (E. Sanchez-Palencia, C. Conca), no stress concentrations are present. (Received September 22, 2011)