
On the method of reflections and its application to homogenization problems

Matthieu Hillairet*¹

¹Institut Montpellierain Alexander Grothendieck (IMAG) – Université de Montpellier, Centre National de la Recherche Scientifique : UMR5149 – UMR CNRS 5149 - Université Montpellier 2, Case courrier 051, 34095 Montpellier cedex 5 - France, France

Abstract

To understand the behavior of a viscous fluid interacting with a cloud of particles, a classical model consists in writing the (stationary) Stokes equations on a perforated domain with boundary conditions mimicking the action of the particles. If the cloud is sufficiently dilute, the "method of reflections" consists in computing the solution to this problem as a sum of solutions around one particle only. In this talk, I am discussing the assumptions making this method converge and its application to the computation of a homogenized model when the number of particles diverges while their radii tend to 0.

*Speaker