



Contribution ID: 259

Type: Oral Presentation

Homogenization of the linearized ionic transport equations in random porous media

Thursday, 3 June 2021 11:45 (15 minutes)

The talk will focus on rigorous homogenization results for a system of partial differential equations describing the transport of a N-component electrolyte in a dilute Newtonian solvent through a rigid random disperse porous medium. We will consider the nonlinear Poisson-Boltzmann equation in a random medium, describe the stochastic homogenization procedure and formulate the convergence results. Then we will show that the two-scale homogenized system is well-posed. In addition, after separating scales, we will justify that the effective tensor satisfies the so-called Onsager properties, that is this tensor is symmetric and positive definite. This shows in particular that the Onsager theory applies to random disperse porous media. Previously, similar results were obtained for periodic porous media in (G. Allaire, A. Mikelic, A. Piatnitski, J. Math. Phys. 51 (2010)).

Time Block Preference

Time Block A (09:00-12:00 CET)

References

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Student Poster Award

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Session Classification: MS24

Track Classification: (MS24 - Invitation Only) Mathematical and computational challenges related to porous media - Special session in memory of Andro Mikelić