

Homogenization of elliptic partial differential systems in non-periodic rough domains

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Abstract

We present a work devoted to study the asymptotic behavior of a sequence of elliptic systems posed in a sequence of rough domains Ω_n . The solutions are assumed to belong to a vectorial space $V_n(x)$ depending on $x \in \overline{\Omega}_n$. This permits to consider several types of boundary conditions posed in variables sets of the boundary and in particular contains classical results for the homogenization of Dirichlet elliptic problems in varying domains. Finally, we also show an application to viscous fluids in non-periodic rough domains.

References

- [1] Bucur D., Feireisl E., Nečasová S., *Boundary behavior of viscous fluids: Influence of wall roughness and friction-driven boundary conditions*, Archiv. Rational Mech. Anal. 197 (2010) 117-138.
- [2] Casado-Díaz J., Luna-Laynez M., Suárez-Grau F.J., *The homogenization of elliptic partial differential systems on rough domains with variable boundary conditions*, to appear in Proceedings of the Royal Society of Edinburgh, Section: A Mathematics .
- [3] Cioranescu D., Murat F., *Un terme étrange venu d'ailleurs*, Nonlinear partial differential equations and their applications. Collège de France seminar, Vols II and III. Eds H. Brézis and J.L. Lions. Research Notes in Math. 60 and 70. Pitman, London, 1982, 98-138 and 154-78.
- [4] Dal Maso G., Defranceschi A., Vitali E., *Integral representation for a class of C^1 -convex functionals*, J. Math. Pures Appl. 9, 73 (1994), 1-46.