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multiscales; 6 Further developments; References

Gabriel Nguetseng and Lazarus Signing Deterministic Homogenization of Stationary Navier-Stokes Type Equations<sup>1</sup> Introduction; 2 Periodic homogenization of stationary Navier-Stokes type equations; 2.1 Preliminaries; 2.2 A global homogenization theorem; 2.3 Macroscopic homogenized equations; 3 General deterministic homogenization of stationary Navier-Stokes type equations; 3.1 Preliminaries and statement of the homogenization problem; 3.2 A global homogenization theorem; 3.3 Macroscopic homogenized equations; 3.4 Some concrete examples

4 Homogenization of the stationary Navier- Stokes equations in periodic porous media 4.1 Preliminaries; 4.2 Homogenization results; References; Patricia Donato Homogenization of a Class of Imperfect Transmission Problems; 1 Introduction; 2 Setting of the problem and main results; 3 Some preliminary results; 4 A priori estimates; 5 A class of suitable test functions; 5.1 The test functions in the reference cell  $Y$ ; 5.2 The test functions in; 6 Proofs of Theorems 2.1 and 2.2; 6.1 Identification of  $1 + 2$ ; 6.2 Identification of  $1$  and  $2$  for  $-1 < < 1$ ; 6.3 Identification of  $u_2$

7 Proof of Theorem 2.4 (case  $> 1$ ) 7.1 A priori estimates; 7.2 Identification of  $1$ ; 7.3 Identification of  $2$ ; References; Georges Griso Decompositions of Displacements of Thin Structures; 1 Introduction; 2 The main theorem; 2.1 Poincar e-Wirtinger's inequality in an open bounded set star-shaped with respect to a ball; 2.2 Distances between a displacement and the space of the rigid body displacements; 3 Decomposition of curved rod displacements; 3.1 Notations; 3.2 Elementary displacements and decomposition; 4 Decomposition of shell displacements; 4.1 Notations and preliminary 4.2 Elementary displacements and decompositions

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## Sommario/riassunto

The focus of this is on the latest developments related to the analysis of problems in which several scales are presented. After a theoretical presentation of the theory of homogenization in the periodic case, the other contributions address a wide range of applications in the fields of elasticity (asymptotic behavior of nonlinear elastic thin structures, modeling of junction of a periodic family of rods with a plate) and fluid mechanics (stationary Navier-Stokes equations in porous media). Other applications concern the modeling of new composites (electromagnetic and piezoelectric materials)

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