

**Mês de:                    ABRIL 2014**

## **MINI-CURSO**

**Dias 1 e 2 de Abril (Terça e Quarta-feira), das 10:30h às 13:00h**  
**na Sala B3-01**

### **The Periodic Unfolding Method in Homogenization**

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#### **Abstract:**

These lectures give a short presentation of the Periodic Unfolding Method [2] and how it applies to the standard model problem of periodic homogenization. The method, originally introduced in 2002 in [1] is based on two distinct ideas, each leading to a new ingredient.

The first idea is a change of scale, which is embodied in the unfolding operator. At the expense of doubling the dimension, this allows to use standard weak or strong convergence theorems in  $L_p$  spaces. Here, it very easy follows that Two-scale Convergence is merely the weak convergence of the unfolding.

The second idea is the separation of scales, which is implemented as a macro-micro decomposition of functions and is especially suited for the weakly convergent sequences of Sobolev spaces.

The application to the standard homogenization problem is easily performed (as it actually follows the same lines as the application of Two-scale Convergence, but in a more explicit and elementary fashion).

The unfolding is particularly well-suited for multiscale problems (a simple backward iteration argument suces) and for precise corrector results without extra regularity on the data.

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[1] D. Cioranescu, A. Damlamian and G. Griso, Periodic unfolding and homogenization, C. R. Acad. Sci. Paris, Serie 1, 335 (2002), 99-104.

[2] D. Cioranescu, A. Damlamian and G. Griso, The periodic unfolding method in homogenization, SIAM J. of Math. Anal. Vol. 40, 4 (2008), 1585-1620.

Apoio:



**PEst-OE/MAT/UI0209/2013**

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