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SEMINÁRIO DE ANÁLISE E EQUAÇÕES DIFERENCIAIS

Dia 19 de Janeiro (quinta-feira), às 13h30, sala 6.2.33

Confinement of dislocations inside a crystal via gamma convergence

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Abstract: We study screw dislocations in an isotropic crystal undergoing antiplane shear. In the framework of linear elasticity, by fixing a suitable boundary condition for the strain (prescribed non-vanishing boundary integral), we manage to confine the dislocations inside the material. More precisely, in the presence of an external strain with circulation equal to n times the lattice spacing, it is energetically convenient to have n distinct dislocations lying inside the crystal. The novelty of introducing a Dirichlet boundary condition for the tangential strain is crucial to the confinement: it is well known that, if Neumann boundary conditions are imposed, the dislocations tend to migrate to the boundary. The results are achieved using PDE techniques and Gamma-convergence theory, in the framework of the so-called core radius approach.

Seminário financiado por Fundos Nacionais através da FCT – Fundação para a Ciência e a Tecnologia no âmbito do projeto UID/MAT/04561/2013

Local: FCUL – Edf. C6 - Piso 2, 6.2.33