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SEMINÁRIO DE ANÁLISE E EQUAÇÕES DIFERENCIAIS

Dia 7 de Julho (quinta-feira), às 13H30, na sala 6.2.33

Topology optimization and minimal partitions using a gradient-free perimeter approximation

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Abstract:

I will present an original functional dedicated to the Gamma-convergence approximation of the relative perimeter of a set. Compared to standard perimeter approximations it has mainly two specific features: on one hand it does not involve the density gradient, hence it can be directly applied to characteristic functions, and on the other hand it can be formulated as the minimum of an auxiliary unconstrained quadratic problem, allowing the use of rather efficient alternating minimizations algorithms.

I will describe the main mathematical properties of this functional and show several examples of applications in topology optimization, where it is incorporated in homogenization or topological gradient methods. Then, I will present natural extensions to minimal partition problems with applications in image classification and deblurring. Finally, I will discuss recent developments towards more general interface energies.

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