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SEMINÁRIO DE ANÁLISE E EQUAÇÕES DIFERENCIAIS

Dia 1 de junho (quinta-feira), às 14h15, sala 6.2.33

Topological derivative for two-scale topology optimization

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Abstract: The aim of the talk is to address multiscale topology optimization problems. For this purpose, the concept of topological derivative in conjunction with the computational homogenization method will be considered and the following techniques will be presented:

• A precise treatment of the interface elements to reduce the numerical instabilities and the time-consuming computations that appear when using the slerp algorithm.

• A closed formula of the anisotropic topological derivative by solving analytically the exterior elastic problem. Complex variable theory and symbolic computation is considered.

• A reduction technique to mitigate the high computational cost of the twoscale topology optimization problem. In addition, the proposed algorithm is modified in order to obtain manufacturable optimal designs.

Finally, two-scale topology optimization examples will be presented in order to display the potential of the methodology.

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