# Periodic Hamiltonian Systems and topology optimization

Dan Tiba
*Institute of Mathematics, Romanian Academy, Bucharest*
dan.tiba@imar.ro

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We consider topology optimization problems governed by linear elliptic equations with Neumann boundary conditions, in dimension two, according to the very recent paper [1] . A similar treatment is possible for other boundary conditions. The unknown domains, where the boundary value problem is defined, are assumed to be contained in a given holdall bounded domain. They are represented via level set functions and their boundary is described analytically by Hamiltonian systems (ordinary differential equations) associated to the level set function. The domains may be multiply connected and during the algorithm their topology characteristics may change. An essential argument in the setting of this new approach is the periodicity property of the Hamiltonian systems and the differentiability of their period with respect to functional variations.

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## Références

[1] C.Murea, D.Tiba, *Periodic Hamiltonian systems in shape optimization problems with Neumann boundary conditions*, J.Diff.Eq. 321 (2022), p.1-39.