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Abstract. Three dimensional (3D) topology optimization problems always involve huge numbers of Degrees of Freedom (DOFs) in finite element analysis (FEA) and design variables in numerical optimization, respectively. This will inevitably lead to large computational efforts in the solution process. In the present paper, an efficient and explicit topology optimization approach which can reduce not only the number of design variables but also the number of degrees of freedom in FEA is proposed ...

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~~Explicit three-dimensional topology optimization via ...~~

We construct a reduced basis by reusing computed solutions from previous optimization steps, and a much smaller linear system of equations is solved on the reduced basis. Two- and three-dimensional numerical results show the effectiveness of the topology optimization algorithm coupled with the reduced basis approach in designing metamaterials.

~~Three-dimensional topology optimization of auxetic ...~~

A constraint-based approach for 3D topology optimization with a large number of element-wise constraints is proposed to obtain an accurate solution. Abstract This paper studies additive manufacturing oriented structural topology optimization with SIMP

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approach and aims at 3D high-resolution printable structural topology design with overhang and horizontal minimum length control for minimum compliance.

~~Three dimensional high resolution topology optimization ...~~

This work presents a computational model for the topology optimization of a three-dimensional linear elastic structure. The model uses a material distribution approach and the optimization criterion is the structural compliance, subjected to an isoperimetric constraint on volume.

~~Topology optimization of three dimensional linear elastic ...~~

three-dimensional Matlab implementation of the PMR scheme. The code allows users to analyze general topology optimization

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problems by defining an appropriate design domain, load conditions, support conditions, predefined fully dense or void regions, and symmetry conditions. The code also provides the capability to impose constraint

## ~~THREE DIMENSIONAL TOPOLOGY OPTIMIZATION OF STATICALLY ...~~

The three-dimensional PMR code is evaluated by two types of optimization problems. The first set of test cases investigated are based on the identification of a known topology for a centrally loaded, simply supported beam.

## ~~"THREE DIMENSIONAL TOPOLOGY OPTIMIZATION OF STATICALLY ...~~

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In topology optimization, the treatment of stress constraints for very large scale problems (more than 100 million elements and more than 600 million stress constraints) has so far not been tractable...

~~Three-dimensional manufacturing tolerant topology ...~~

This paper presents a new application of fluid topology optimization. Full three-dimensional geometries have been automatically optimized considering both pressure losses and heat exchange as objective. For the first time TO has been applied on a simplification of gas turbine heat transfer problem.

~~Three dimensional fluid topology optimization for heat ...~~

Abstract. In topology optimization, the treatment of stress constraints for very large scale problems (more than 100 million



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elements and more than 600 million stress constraints) has so far not been tractable due to the failure of robust agglomeration methods, that is, their inability to accurately handle the locality of the stress constraints. This article presents a three-dimensional design methodology that alleviates this shortcoming using both deterministic and robust problem ...

~~Three-dimensional manufacturing tolerant topology ...~~  
optimization process (Pietropaoli et al. 2017). Using uniformly heated walls as boundary condition, this problem is a simplification of the coolant channel optimization for turbine blades. In this work, a similar model is applied to three-dimensional geometry, such as a square duct. The optimization is carried in order to increase

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~~Three dimensional fluid topology optimization for heat ...~~

The topology optimization method for three-dimensional electromagnetic waves is implemented by a gradient-based iterative procedure, where the gradient information is derived by sensitivity analysis as demonstrated in § 2 b,d respectively, corresponding to the variational problems in equation ( 2.7) and ( 2.23 ).

~~Topology optimization for three dimensional ...~~

Abstract. This paper proposes a topology optimization formulation for the three-dimensional (3-D) design of segmented permanent magnet (PM) arrays. Specifically, the proposed formulation aims to find an optimal 3-D structural topology of PM segments and their discrete magnetization directions.

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~~Topology optimization for three dimensional design of ...~~

A moving morphable patch is employed for three-dimensional topology optimization. □ Vertex coordinates and thickness of a patch are used as design variables. □ Triangular shape of a moving morphable patch freely morphs to shell or beam shape. □ Patches are constrained to prevent assembling for over-sized members by avoiding non-perfect overlapping.

~~Moving morphable patches for three dimensional topology ...~~

Summary. This article proposes an efficient approach for solving three-dimensional (3D) topology optimization problem. In this approach, the number of design variables in optimization as well as the number of degrees of freedom in structural response analysis can be reduced significantly. This is accomplished through the use

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of scaled boundary finite element method (SBFEM) for structural analysis under the moving morphable component (MMC)-based topology optimization framework.

~~A scaled boundary finite element based explicit topology ...~~

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On Barrier and Modified Barrier Multigrid Methods for Three-

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~~On Barrier and Modified Barrier Multigrid Methods for ...~~

This paper presents a three-dimensional design methodology that alleviates this shortcoming using both deterministic and robust problem formulations. The robust formulation, based on the three-field density projection approach, is extended to handle manufacturing uncertainty in three-dimensional stress-constrained problems.

~~[2006.12927] Large scale three dimensional manufacturing ...~~

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Three dimensional fluid topology optimization for heat transfer:

Authors: Pietropaoli, M Montomoli, F Gaymann, A: Item Type:

Journal Article: Abstract: In this work, an in house topology optimization (TO) solver is developed to optimize a conjugate heat transfer problem: realizing more complex and efficient coolant systems by minimizing ...

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