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Topology Optimization of Aerospace Materials and Structures

Guest Editor:

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Message from the Guest Editor

Dear Colleagues,

Topology optimization is an effective mathematical method that optimizes material layout within a given design space, for a given set of loads, boundary conditions and constraints with the goal of maximizing the performance of the structure system. Several gradient-based and gradient-free topology optimization techniques have been developed during the past several decades. Recently, this technique has experienced a surge in interest as a tool for novel design in aeronautics and aerospace engineering problems. However, due to the intricacy and high-performance requirements, the topology optimization theoretical framework of aerospace structures is far from being complete and many challenging problems are still open. Therefore, the purpose of this issue is to survey recent advances in topology optimization techniques applied in aerospace materials and structures. The topics include novel topology optimization algorithms and new applications linking aerospace material and structure design considering uncertainties, multi-physical coupling, large-scale, extreme performance, smart materials, complex nonlinearity, etc.

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Message from the Editor-in-Chief

Symmetry is ultimately the most important concept in natural sciences. It is not surprising then that very basic and fundamental research achievements are related to symmetry. For instance, the Nobel Prize in Physics 1979 (Glashow, Salam, Weinberg) was received for a unified symmetry description of electromagnetic and weak interactions, while the Nobel Prize in Physics 2008 (Nambu, Kobayashi, Maskawa) was received for the discovery of the mechanism of spontaneous breaking of symmetry, including CP symmetry. Our journal is named *Symmetry* and it manifests its fundamental role in nature.

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