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Editorial Note

Preface

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The competitive cost of numerical simulations over laboratory studies, due to the continued advancements in computing performance, has made computational fluid dynamics an integral tool in the study of engineering problems. This topical special focus issue "Optimal Fluid Systems and Machinery" of the Journal of Research on Engineering Structures & Materials (RESM) covers a varied range of engineering systems. It contains papers selected on the basis of the results of regular peer review of the short manuscripts submitted for consideration by the participants of the Special Session "Fluid Flow, Energy Transfer and Design" at the 13th International Conference on Diffusion in Solids and Liquids (DSL2017) held in Vienna, Austria.

The rapid growth of wind power generation and the need for a smarter grid with decentralized energy generation motivated the study of Batiata et al. [1]. They studied the self-start ability of vertical axis wind turbines, and suggested a new methodology that offers a substantial time reduction in the first steps of new blade profiles development.

Plates used as structural elements in the construction of bridges, offshore structures, etc., are subjected to compression stresses. A geometric evaluation of stiffened plates subjected to a uniformly distributed transverse loading is presented by Cunha et al. [2]. Helbig et al. [3] studied the presence of perforations in plates that causes a redistribution of stresses, affecting both the resistance and buckling characteristics.

Since the introduction of the concept of microchannel heat sink during the 1980s, there has been a huge growth of compact heat exchangers. It is required compactness ally to high dissipation of heat fluxes. Yenigün et al. [4] studied optimal time delay of the fluid flow in parallel and tree-shaped vascular channel structures heated with random heat loads.

A knowledge of properties of soil and rocks is important to improve estimates of underground resources. To gain insight regarding the dynamic poroelasticity of a soil, a coupling of the both the Genetic Algorithm and the Boundary Element Method are used by Anunciação Jr. et al. [5].

Residues of furfural (C5H4O2) production used in chemical and pharmaceutical engineering has a high moisture content which is harmful to environment. Ji et al. [6] evaluated the drying capacity of these residues, and made some brief suggestions about the design of a drying-combustion integration system for furfural residues.

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