

FOREWORD

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The issue includes selected papers to be presented at the 23rd Fluid Mechanics Conference held in Czestochowa on September 08–12, 2018 (<http://kkmp2018.wimii.pcz.pl>). The issue opens with the paper presenting the hybrid MPI + OpenMP (Message Passing Interface/Open Multi-Processor) algorithm used for parallel programs based on the high-order compact method. The presented results show a potential for acceleration of fluid flow simulations as well as for application using high order methods. The following papers are focused on detailed analysis of the flow structure modeling. In the first paper, the authors describe the developed active cell model and show a prediction of the flow field around a single-bladed vertical-axis wind turbine with a Darrieus-type rotor. The objective of the next paper is modeling of hydrogen production by methanol decomposition in a thermocatalytic reactor based on the intermetallic phase of Ni₃Al. The model was implemented by means of User Defined Functions to include surface chemical reaction rates in the interphase between the fluid and the solid.

The transport of solid particles by the liquid and the influence of chosen deflocculants on decreasing the hydromixture viscosity and lowering the wall shear stresses as a consequence is the subject of the following paper. The author presents that an addition of a deflocculant in a suitable composition leads to improvement in the effectiveness of hydromixture transport.

A problem of analytical-numerical modeling of the plane wave propagation from an ocean surface to the atmosphere is considered in the fifth paper. The authors discuss the effect of acoustic waves on the transport of energy and the momentum from the lower atmosphere to thermosphere heights.

The issue closing paper is focused on experimental investigation of a boundary layer on a flat plate in an adverse pressure gradient. Based on the Particle Image Velocimetry measurements, streamwise vortex structures are detected and their evolution is investigated.

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