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# Special issue on computational heat transfer and fluid dynamics

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The Asian Symposium on Computational Heat Transfer (ASCHT) conference has become a unique platform for discussion of ideas and sharing of knowledge in the field of computational methods in heat transfer and fluid flow. Over the years, it has brought together many experts of the field from academia and the industry. It has thus proved to be immensely fruitful for budding researchers in the field.

Accordingly, the sixth edition of ASCHT (2017) was hosted at the Department of Mechanical Engineering, Indian Institute of Technology Madras, Chennai (India). The response to the conference announcement was very good. A total number of 193 full manuscripts were received. All submissions were reviewed by at least two experts in the subject domain. In the final form, the proceedings include 155 papers that have been found suitable for presentation at the symposium. These cover a variety of topics in the traditional as well as futuristic areas of computational heat transfer and fluid flow.

The two special issues of International Journal of Advances in Engineering Sciences and Applied Mathematics include thirteen carefully chosen peer reviewed papers focused on various topics of current interest in computational heat transfer and fluid dynamics.

The six papers presented in the current issue (Special Issue I) deal with a wide range of computational aspects of heat transfer and fluid dynamics. The first article presents the capability of Implicit Large Eddy Simulation (ILES) to capture transition. It reveals the advantages of ILES over other methods such as Reynolds Averaged Navier–Stokes (RANS) and conventional Large Eddy Simulation (LES) and Direct Numerical Simulation (DNS). In the next article, heat and fluid flow during natural convection between vertical heated parallel plates in the presence of magnetic field is numerically studied by Lattice Boltzmann Method (LBM). The vortices induced by the magnetothermal force in the buoyancy flow results in suppression of natural convection below the wire elevation and enhancement above it. The subsequent article presents a numerical code to evaluate the performance of natural convection based decay heat removal system of a typical pool type sodium cooled fast reactor. The code predicts the heat transfer from the primary sodium to ambient air through three coupled natural circulations loops without demanding for small time steps. This is followed by an article that presents a probability statistics method to generate the turbulent boundary layer for LES inflow condition. The aspect ratio of the grid spacing seems to influence the distortion of turbulent statistics, caused by LES calculation. The next article deals with the Direct Numerical Simulation (DNS) of Taylor–Couette flow between counter rotating cylinders at small radius ratio. The study shows that there exists a critical value of the radius ratio between 0.2 and 0.3, below which the Taylor-vortex on the inner cylinder side does not exert a significant influence on the outer side flow. The last article investigates how the change of viscoelasticity of photosensitive micellar solutions by light irradiation relates to flow structure and heat transfer performance. The results indicate that the decrease of the viscoelasticity with light irradiation causes the decrease in heat transfer rate and pressure drop.

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