Special issue on “PDE models and computation”

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Computer based simulations are of growing importance and demand in all fields of engineering and sciences. Differential Equation (DE) and Partial Differential Equation (PDE) models, their theory, numerical methodologies and accurate and efficient computing procedure present many interesting challenges. DEs and PDEs play a crucial role in modeling complex real problems. So theoretical investigations into wellposedness, stability and controllability become important. Also important are the devising of clever numerical procedures and architecture based scientific computing tools.

This issue is a collection of eight original papers, peer reviewed, written by a team of experts from varied domains and who have large experience in handling real world applications and real industrial problems. Each and every paper offers insight into the related problems and give scope for new challenges therein.

1 To highlight

Prof. Oleg Iliev and colleagues from Fraunhofer ITWM, Germany have demonstrated the power of computational modeling which significantly aid membrane researchers and manufacturers.

Dr. Sasikumaar Ganesan of Super Computing Centre, IISc Bangalore has demonstrated the capabilities of variational multiscale methods for turbulent flows.

Prof. Thomas Goetz and his team from Uni-Koblenz, Germany have emphasized the elegance of optimization in modeling through real cases from epidemiology and biomechanical models for muscles.

Prof. Vasudevamurthy and his students from TIFR-CAM, Bangalore have considered an important problem of sea breeze models with a thorough analysis on how to handle singularities appearing in the inviscid case.

Prof. Axel Klar and his team from AG Technomathematik, TU Kaiserslautern, Germany have presented a new approach for rigid body movement in a gas combining elegantly DSMC particle method for Boltzmann region and FPM for Navier–Stokes region.

Prof. Jitendra Kumar along with his student from IIT Kharagpur developed an accurate FVM scheme for pure breakage PBEs which is considered as an important contribution in the world of PBE numerics.

Aerospace scientist Prof. Raghurama Rao and his collaborators from IISc Bangalore contributed a novel scheme in finite volume framework for the systems of hyperbolic conservation laws.

IIT Madras Chemical Engineer Prof. Chidambaram and his student have introduced a new experimental based models for the unstable inverted pendulum systems with comparable PID controllers.

Another set of eight to ten original papers, will be published in the next issue.

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