Guest Editorial

Multiphysics treat simulations that involve multiple physical models or multiple simultaneous physical phenomena. Applied multiphysics models have been developed during the past years to better simulate the behavior of complex processes. This development is also driven by the need to improve the understanding of real physical phenomena in order to develop and design safer and more efficient products which are environmentally friendly. The advances in computer hardware and software packages like COMSOL provide access to multiphysics modeling by great number of people. Moreover, the COMSOL software is designed to simulate systems of coupled PDEs which may be 1D, 2D or 3D, non-linear and time dependent. An important feature of COMSOL is that the user can focus on the modeling itself and does not have to spend much time on meshing, solving and visualization.

There is now a large number of science and engineering communities whose research is being customized towards multiphysics using COMSOL. Although these communities have been publishing their research outcomes in various platforms, the publishing of studies which combine the knowledge from various scientific approaches with education is still limited. The aim of this issue is therefore to provide some background knowledge about multiphysics modeling using COMSOL and applications for engineering education.

The special issue includes nine papers. The topics of the papers included in the issue are: teaching heat and moisture transport modeling, teaching groundwater flow and transport, heat transfer education, accuracy tuning of multiphysics simulations, teaching stress/strain distribution, bioengineering, application of CFD for designing double glass, thermal analysis of power cables and teaching CFD engineering.

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