HPC-BASED SIMULATIONS FOR THE WIDE INDUSTRIAL REALM: AEROSPACE, AUTOMOTIVE, BIO, CONSTRUCTION, HEAVY…

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ABSTRACT

Supercomputers have made available to researchers an unprecedented amount of computing power. But "power without grip is useless": this availability of thousands of processors to compute must be accompanied with a steep evolution in software development based on HPC techniques, to open a completely new way of facing the most complex simulation problems of Computational Physics and Engineering. Especially in technology niches such as industrial, energy, environmental or biomechanical applications, treatment of complicated or coupled phenomena of fluid and solid motions are always a big issue, which always require as much computer resource as possible.

Thus the objective of this Mini-Symposium is to communicate and discuss issues and perspectives of HPC simulation, targeting industrial applications which cover fields of such as bio, automotive, aerospace, pharmacology, energy, environmental and so on. The expected topics should include algorithms, simulation strategies, and programming techniques for the kind of complex simulations of fluid/solid phenomena (usually including coupled multiphysics) requiring massively HPC environment. Parallel issues such as the robustness and performance analysis, and introduction of pre- and post-processing techniques such as CAD integration, mesh generation or visualization are also welcome. It is preferable, but not indispensable, that authors include some numerical results of the applications to discuss the validity of the proposed methods.