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THE LATIN METHOD: A PARADIGM FOR MULTISCALE AND MULTIPHYSICS COMPUTATIONAL METHODS

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ABSTRACT

Over the last few decades, considerable progress has been made in computational mechanics, particularly in its modeling aspect. This results in physically sound models which are very often multiscale and multiphysics, time-dependent and highly nonlinear. Unfortunately, the use of such models with classical finite element codes could lead to prohibitive costs.

The LATIN method is a paradigm for alternative computational strategies capable of solving engineering problems beyond the calculation limits of today's classical codes. In order to achieve this goal, these iterative strategies are rooted in specific properties of the physical problems being studied. At each iteration, they produce an approximation of the complete structural response over the whole loading history being considered, which distinguishes the LATIN method from classical incremental or step-by-step techniques.

The talk will focus on the basic features of the LATIN method and present some examples illustrating its capabilities. The latest developments and perspectives related to multiscale / multiphysics computational strategies and to parallel computing will also be presented.