
An introduction to Parallel-in-Time methods

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Abstract

With the increase in the number of processors in supercomputers, additional spatial parallelism has been possible allowing the usage of finer models. However, in order to preserve the stability of numerical schemes, with a refinement of the spatial grid often comes a refinement of the time grid. This causes increased computational times.

In this mini-course, we will introduce some of the main parallel-in-time methods: Parareal, Multigrid Reduction-in-Time (MGRIT), Space-Time Multigrid (STMG), Schwarz Waveform Relaxation (SWR), ParaExp. Each of these methods will be briefly presented and a selection of their properties will be discussed.

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