

PinT schemes using time as a parameter

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When thinking about parallel in time schemes, one often tends to view time as a variable to discretize within a numerical scheme (that usually involves a time marching strategy). In this talk, I propose to review alternative strategies where time can be seen as a parameter so that computing the PDE solution at a given time would consist in evaluating closed formulas or in solving tasks of very low computational cost that do not involve any time marching. This type of approach is by nature entirely parallelizable. It can be achieved by either leveraging analytic formulas (whose existence strongly depends on the nature of the PDE), or by learning techniques such as model order reduction. For the later strategy, convection dominated problems are challenging (just like in classical PinT schemes such as parareal) and I will present recent contributions to address this type of problems.