A numerical study of a micro-macro model-reduced parareal method for scale-separated SDEs

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Abstract

Time-parallel methods can reduce wall clock time for accurate numerical solutions of differential equations by parallelising across the time dimension. In this talk, we present and test the convergence behavior of a micro-macro version of a two-level MGRiT method, in which the fine propagator is based on a high-dimensional slow-fast microscopic model, and the coarse propagator is based on its low-dimensional (approximate) effective dynamics at slow time scales. We numerically study how the model error of the approximate model (with respect to the high-dimensional model) influences the convergence of the algorithm.