

A parareal algorithm for solving highly oscillatory Vlasov equations

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We solve numerically multi-scale in time Vlasov-type models, by using a specific version of the parareal algorithm. More precisely we use for the coarse solving reduced models obtained from the two-scale asymptotic expansion method. The reduced models are useful to approximate the original Vlasov model at a low computational cost since they are free of high oscillations. We illustrate this strategy with numerical experiments based on long time simulations of charged particle beams in an electromagnetic field. We provide an analysis of the efficiency of the parareal algorithm in terms of speedup.