An Investigation into Parareal

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Pseudocode

Require: y_0 and course and fine solvers $\mathcal{G}$, $\mathcal{F}$.

$y_c \leftarrow \mathcal{G}(t_f, t_0, y_0)$. ▷ Coursely approximate solution

$y \leftarrow y_c$.

while $\mathrm{iter} < \mathrm{max\_iter}$ && not converged **do**

for $n = 0 \rightarrow P$ **do** ▷ Parallel capable

$y_f(n) = \mathcal{F}(t_{n+1}, t_n, y(n))$. ▷ Note FSAL property

$\delta y(n) = y_f(n) - y(n)$. ▷ corrector term.

end for

for $n = 0 \rightarrow P$ **do**

$v = \mathcal{G}(t_{n+1}, t_n, y(n))$. ▷ Predict.

$y(n) = v + \delta y(n)$. ▷ Correct.

end for

end while