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OpenMP computing of a reference solution for coupled Lorenz system on [0,400]

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Obtaining a long term reference trajectory on the chaotic attractor for coupled Lorenz system is a difficult task due to the sensitive dependence on the initial conditions. Using the standard double-precision floating point arithmetic, we cannot obtain a reference solution longer than 2.5 time units. Combining OpenMP parallel technology together with GMP library (GNU multiple precision library), we parallelize Taylor series algorithm for coupled Lorenz system and obtain in 6 days a reference solution in the rather long time interval - [0,400].

Summary

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