Numerical solutions of thalamo-cortical systems

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A new algorithm for accurate and efficient solutions of thalamo-cortical systems will be introduced. The idea of the new algorithm is based on the properties of the kernels, which are applied to the systems. According to these properties, a moderate value $t_0 > 0$ is determined and the interval $[0, T]$ of the time integration of the systems is divided into two parts, $[0, t_0]$ and $[t_0, T]$. Large values of T are investigated with T significantly larger than t_0. Classical methods are applied to solve the systems in the first short subinterval $[0, t_0]$. Then, new iterative schemes are applied on the remaining longer subinterval $[t_0, T]$.

The new algorithm is fast and brings two additional advantages: (1) the length of the interval $[t_0, T]$ can be arbitrarily large, and (2) the thalamo-cortical systems can be efficiently integrated in a parallel computing environment. Error bounds for the new iterative schemes are derived and their rapid convergence on long time intervals $[t_0, T]$ is demonstrated by numerical experiments.

Friday, October 17th, 2008
2:40PM
Room: MG 120
Refreshments in MG 226 at 2:20pm