Numerical Solution of a Singularly Perturbed HIV Model

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   In [1] a mathematical model of an HIV problem is described, which is an initial value problem for a system of singularly perturbed differential equations with several different time scales. The main mathematical emphasis there is a detailed theoretical study of the reduced problem, obtained by formally putting the singular perturbation parameters equal to zero. This reduced problem is then solved numerically and the numerical solutions are observed to converge to equilibrium points in a variety of cases. Here, we apply robust computational methods, described in general for example in [2], to obtain numerical solutions to the full problem, rather than the reduced problem. In particular the results in [3] for singularly perturbrd linear systems are required. These numerical solutions are observed to converge to the exact solution of the full problem, in the maximum norm, uniformly with respect to the values of the singular perturbation parameters.

References

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