Numerical Mathematics and Applied Analysis Group Seminar (NMAA)

An Application of Homopoty Analysis Method to a HIV Model

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Abstract

Based on homotopy, which is a basic concept in topology, a general analytic method (namely the homotopy analysis method) is proposed to obtain series solutions of nonlinear differential equations. Different from all previous analytic methods, it provides us with a simple way to adjust and control the convergence of solution series. In this talk, we apply the homotopy analysis method to a model in HIV-infection. In HIV-1 infection, there is a rapid development of resistant virus to all known drugs. Often a single-point mutation can greatly reduce sensitivity to a particular drug. The rate at which the abundance of a resistant mutant rises needs to be computed. Before drug therapy the resistant mutant virus is held in a mutation-selection balance. It is continuously generated by the sensitive wild-type, but has a slight selective disadvantage. The model is an appropriate system that describes this mutation-selection process. I shall apply the homopoty analysis method to this model and obtain the series solution.

All are welcome