

Application of the center manifold theory to a class of discrete dynamical systems

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We propose a direct analogue of the main theorem in the paper by Catillo-Chavez and Baojun Song (Dynamical Models of Tuberculosis and their Applications-2004) for the bifurcation analysis by Center Manifold Theory of n -dimensional nonlinear dynamical system with a simple zero eigenvalue. We design a nonstandard finite difference scheme(NSFD) for an epidemiological model. Applying the discrete theorem, it is shown that the NSFD replicates the property of the continuous model of having a backward bifurcation at the value 1 of the basic reproductive number R_0 .

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