NUMERICAL MODELING OF EPIDEMIC PROPAGATION

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In order to have an adequate model, the continuous and the corresponding numerical models on some fixed mesh should preserve the basic qualitative properties of the original phenomenon. In the talk we focus our attention on some discrete mathematical models of biology, namely we consider some continuous and discrete epidemic models and we will investigate their qualitative properties. First we investigate the SIR model. We give those conditions for the continuous and finite difference discrete models, under which the non-negativity and some other basic qualitative properties (mass conservation, monotonicity) are valid. Special attentions will be paid to the propagation of malaria. We formulate and investigate different discrete models and we give sufficient conditions for the preservation of the basic qualitative properties. Numerical examples demonstrate the sharpness of the results.