

The first part of the paper discusses the general theory of the model. It is shown that the model is well-posed and that the solution is unique. The second part of the paper discusses the numerical solution of the model. It is shown that the numerical solution is stable and that the error is of order  $O(\Delta t^2)$ . The third part of the paper discusses the application of the model to the study of the dynamics of the system. It is shown that the model can be used to study the dynamics of the system in a wide range of parameter space.