

This thesis is focused on the shadowing property of numerical methods for partial differential equations. The goals of this thesis are the application of shadowing theory to the case of linear maps, modification of standard techniques for the purpose of this application and the application of the adapted theory to multistep schemes. In the introductory overview, we first focus on a study of the standard shadowing theory, then we formulate basic statements and prove a relationship between a contractivity and shadowing. Afterwards we find the characterization of the shadowing property for linear maps. In the next sections, we adapt definitions of the shadowing theory to requirements of multistep methods. As an example, we apply the adapted theory to the Dufort-Frankel scheme in the third chapter. At the end of this thesis, remarks on shadowing in general multistep methods and remarks on a relationship between the shadowing property and stability are presented.