

Abstract

In this thesis we study the Kronecker product and its applications in solving matrix equations. First we will give some preliminaries as a good tool to understand the calculations we will do with the Kronecker product. The preliminaries contain material from linear algebra and ordinary differential equations (ODE). We deal with the Kronecker product together with the vec – operator on matrix equations. The method is then applied to a special class of matrix equations, Lyapunov equations, in particular their relations to stability theory for linear dynamical systems are investigated. We will also study three different methods to solve the least square problem in the formulation of Kronecker product.