

中文摘要

本文主要係研究一個新的電腦輔助頻域分析方法，其係在 Matlab / Simulink 環境下，分析液壓伺服控制系統的頻率響應。本文將此方法應用於三種液壓伺服控制系統，即電液伺服閥、具激勵信號之液壓伺服致動器及射出成型機射膠系統，並產生相對應的相位落後與增益值，使得無法使用頻率分析的液壓伺服控制系統，在 Matlab/Simulink 軟體輔助下，得到所需要的頻率響應值，並利用 Matlab/Simulink 軟體繪出此三系統的數學方塊圖，本文並針對模擬結果進行討論。由模擬結果可證實此方法在液壓伺服控制系統中可有效的預測液壓伺服系統中頻率響應之特性，此可驗證本方法之可行性。

英文摘要

This thesis mainly studies a new computer-aided method of frequency domain analysis via the Matlab / Simulink software to analysis the frequency response of the hydraulic servo control systems. In this thesis, three kinds of hydraulic control systems, namely the electro-hydraulic servovalve, hydraulic servoactuator with dither signal and servo-injection system of the injection molding machine, are analyzed by this new method and the magnitude and phase responses of these systems are also calculated. Therefore, the problem of the classical frequency response method which cannot be applied in the nonlinear systems, can be solved by this new method. This thesis also shows that the mathematics block diagrams of these three systems using the Matlab/Simulink software and the simulation results. From the simulation results, the sinusoidal responses of these nonlinear hydraulic systems have been discussed. The results of this thesis have also verified that this new method can be adequately predicted the magnitude and phase bandwidth of these systems which have not been shown in any papers.