# Advanced Process Control of Metal Sputter Deposition Using a Time Series Analysis

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## Abstract

By the time series model, this paper constncted the disturbance model for the aluminum sputter deposition process, and derived the Autoregressive integrated Moving Average and Least-Square (ARIMA-LS) controller based on this new disturbance model. Experimental results reveal that ARI(3,1) model appropriately characterizes the dynamic behavior of the disturbance for the processes. The ARIMA-LS controller which includes information of process noise is able to regulate the model coefficients automatically as the target is replaced or degrades. In this paper, the d-EWMA controller and ARIMA-LS controller have been applied to aluminum sputter deposition processes for predicting deposition rates and comparing their performances. The application of ARIM.A-LS controller here is proven to improve the estimating accuracy of the aluminum sputter deposition process significantly.

Keyword：time series model, deposition rate, d-EWMA controller.