

Phase II Monitoring of First-Order Autocorrelated General Linear Profiles

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Abstract : Statistical process control has been successfully applied in a variety of industries. In some applications, the quality of a process or product is better characterized and summarized by a functional relationship between a response variable and one or more explanatory variables. A collection of this type of data is called a profile. Profile monitoring is used to understand and check the stability of this relationship or curve over time. The independent assumption for the error term is commonly used in the existing profile monitoring studies. However, in many applications, the profile data show correlations over time. Therefore, we focus on a general linear regression model with a first-order autocorrelation between profiles in this study. We propose an exponentially weighted moving average charting scheme to monitor this type of profile. The simulation study shows that our proposed methods outperform the existing schemes based on the average run length criterion.

Keywords : autocorrelation, EWMA control chart, general linear regression model, profile monitoring

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